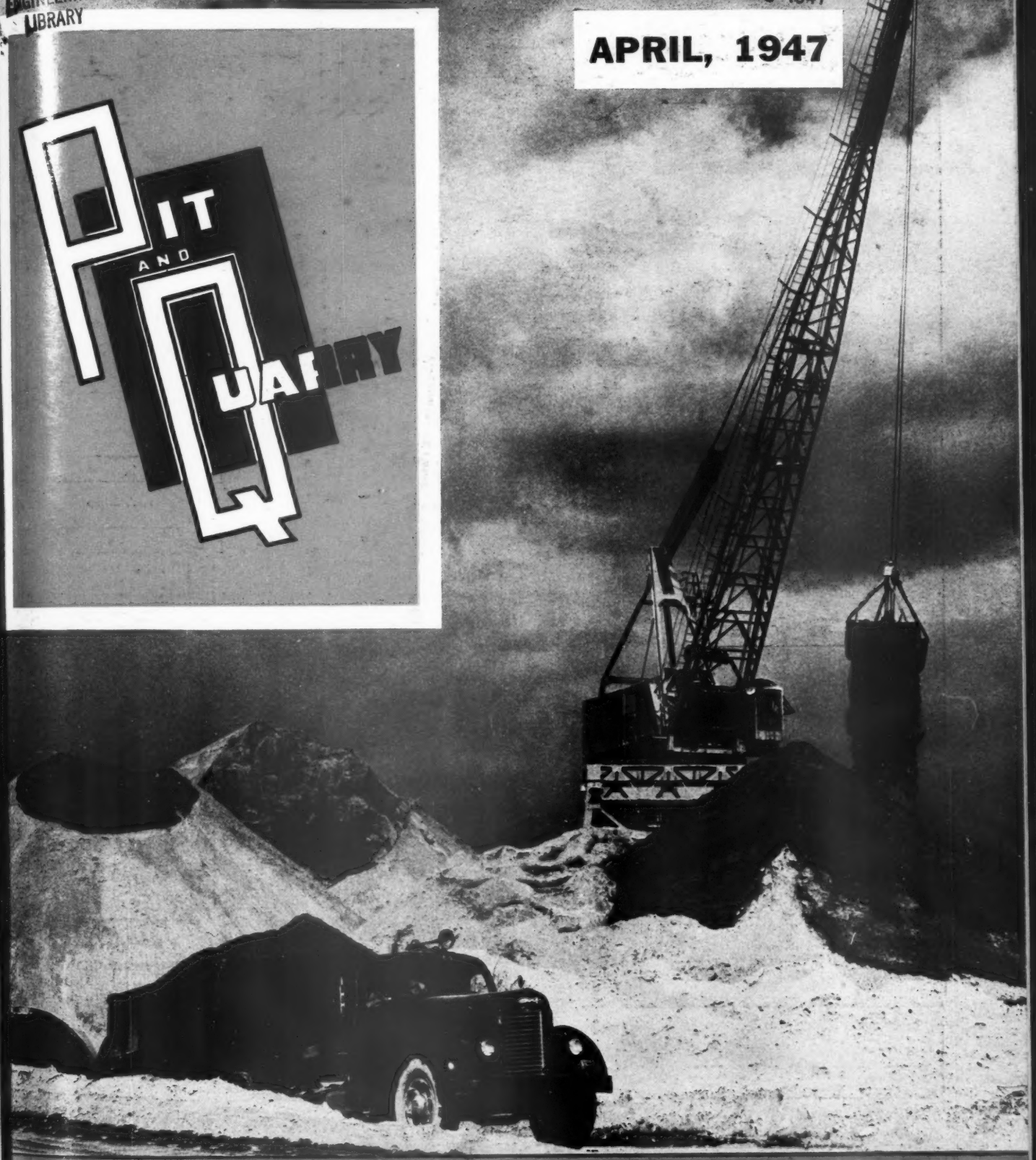
ENGINEERING
LIBRARY

APR 23 1947

APRIL, 1947

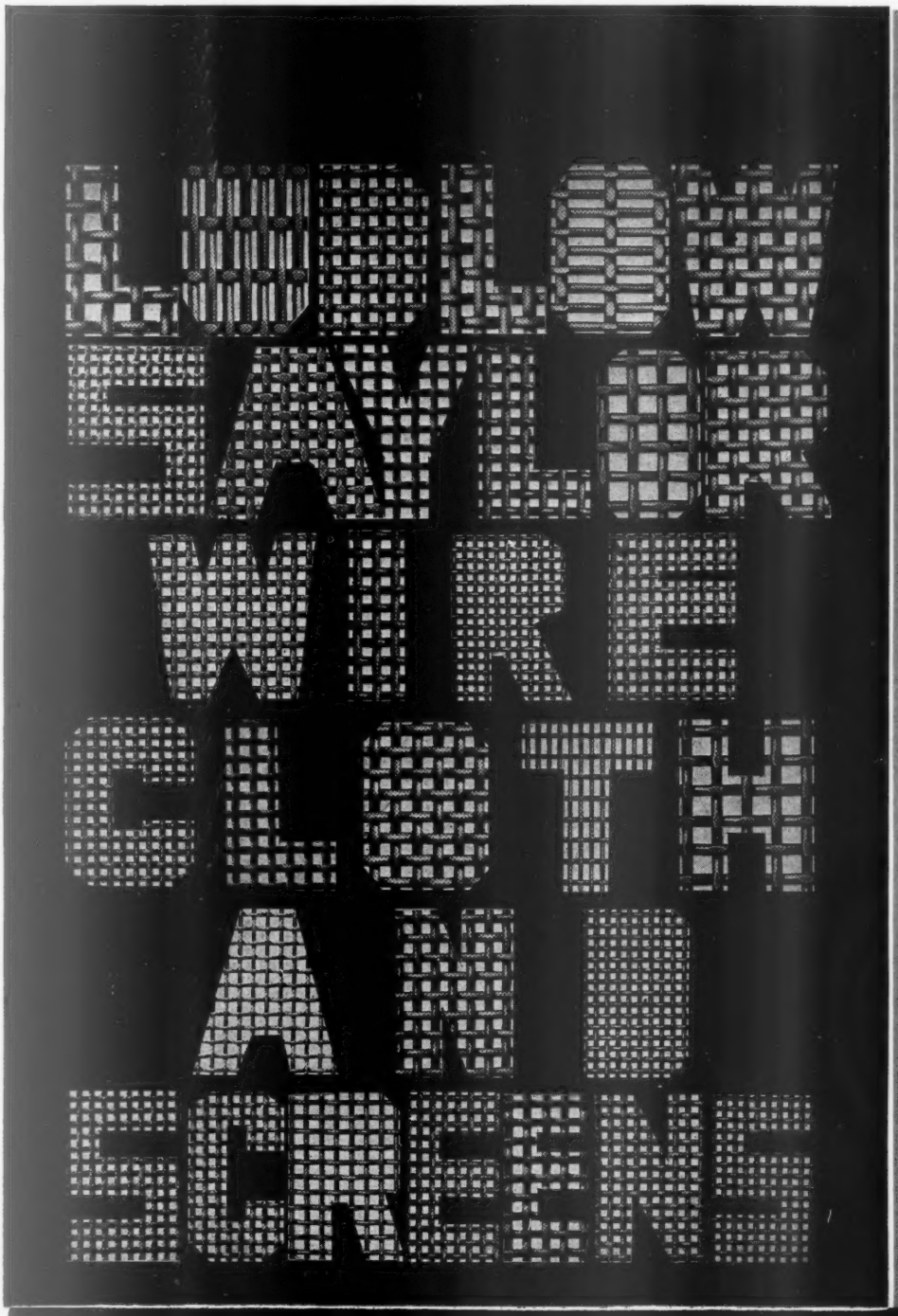
PIT AND QUARRY

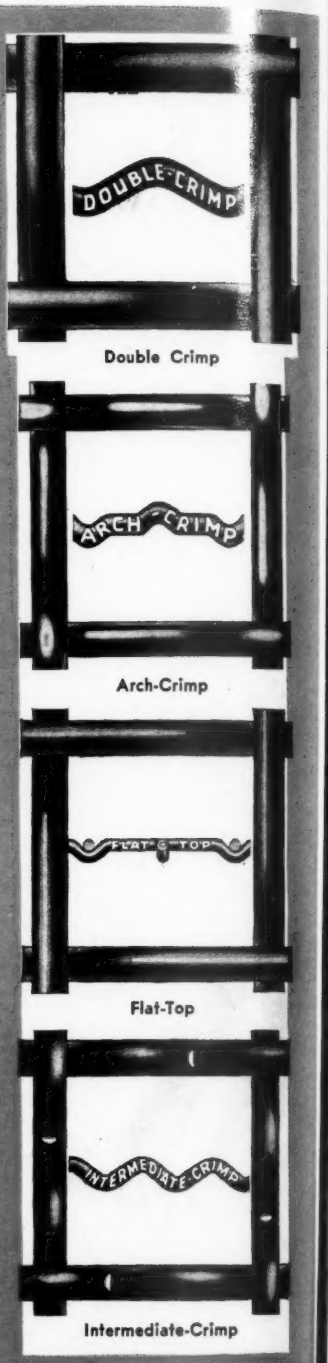


Yard of Graham Bros., El Monte, Calif., plant visited by Conventioneers.

In this Issue

Complete Illustrated Reports of the Annual Convention of Natl. Sand and Gravel Assn., Natl. Ready Mixed Concrete Assn., Amer. Conc. Pipe Assn., A. C. I., A. R. B. A.—General Article on Use of Drop Balls in Quarries

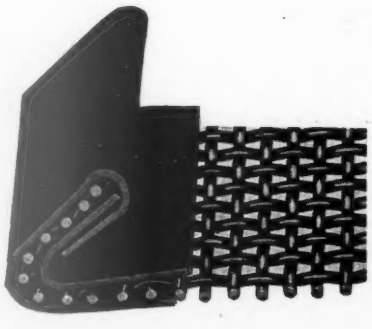




The LUDLOW-SAYLOR WIRE COMPANY

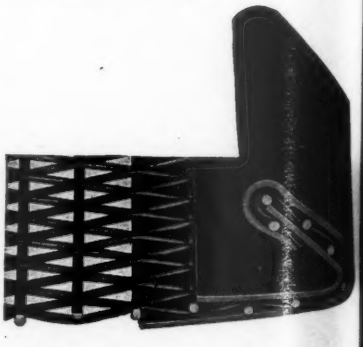
NEWSTEAD AVENUE & WABASH RAILROAD — ST. LOUIS 10, MO.

SUPER-LOY LIVE-WIRE SCREEN DECKS and JACKETS



Engineered to your exact requirements.

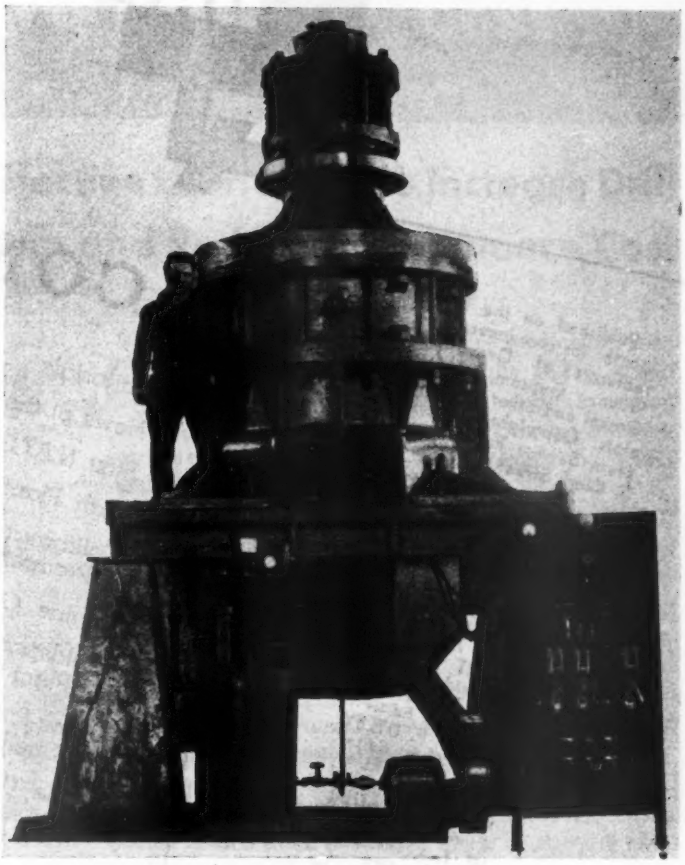
Order Ludlow-Saylor *Engineered* Hook-Strips for tensioning vibrator-screen decks. They transmit to every tensioned wire an equal share of uniform vibration, evenly distributed throughout the entire screen area. They make screen decks last longer — step-up screen capacities — are easier to handle—quicker to install—need fewer adjustments and renewals.



NO GEARS
LESS POWER

CHECK THE

NEW MODERN KENNEDY GEARLESS ROLLER BEARING CRUSHER



- ✓ No GEARS
- ✓ Extra Heavy Alloy Steel Shaft
- ✓ Improved Pressure Type Streamline Oiling System
- ✓ Built-In Synchronous Motor
- ✓ Type 'S' Spring Suspension for Tramp Iron Protection
- ✓ One-Piece 3-Angle Reversible Manganese Concave Ring
- ✓ Two-Angle Manganese Mantle

2 PARK AVENUE • NEW YORK 16, N. Y. FACTORY: DANVILLE, PA.

PIT AND QUARRY

APRIL 1947
Vol. 39 No. 10

CONTENTS

Editorials 48
News of the Industry 51
First N.S.G.A. Meeting West of Rockies 59
Utah Plant Turns out Special Products 68
California Firm Makes Three Types of Products in Combination Setup . . 69
Maine Operator Installs Laboratory . 71
Feldspar-Silica Operations at Arizona Plant Continuing Full Production . . 74
One-Piece Bearings Mounted in Steel Shells Solve Bearing Troubles . . 76
The Use of the Drop Ball 77
The Lime Plant Operator 81

The Concrete Manufacturer

News of the Industry 103
Ready Mixed Concrete Convention . 105
Stanton Walker Elected A.C.I. President 110
Ready-Mix Plant Utilizes Two-Level Site 111
Progressive New Illinois Block Plant Serves Suburban Area of Chicago 113
Wire Mesh Specifications Presented to A.C.P.A. at Meeting in St. Louis . . 114

Personal Mention 84
Obituaries 86
New Machinery 87
Trade Notes 92
Legal Decisions 93
Traffic News 97
Index to Advertisers 170

MEMBER AUDIT BUREAU OF CIRCULATIONS

PIT AND QUARRY IS INDEXED IN THE ENGINEERING INDEX

To subscribers: Date on lower right-hand corner of envelope indicates issue with which your subscription expires. In writing to have address changed, give old as well as new address.

Published on the first of each month for producers and manufacturers of Cement, Crushed Stone, Gypsum, Lime, Sand, Gravel and other nonmetallic minerals. Copyright 1947 by Complete Service Publishing Co., 538 S. Clark Street, Chicago 5, Ill.

H. W. BAUMGARTNER
President
JAMES E. MONTGOMERY
Vice-President and Advertising Manager
WALTER E. TRAUFFER
Editor
WILLIAM M. AVERY
Senior Field Editor
ROBERT W. SPAKE
Field Editor
EDWARD J. BRUNENKANT
Assistant Editor
HARRY F. UTLEY
Pacific Coast Editor
M. E. ANSEL
News Editor
WOLF G. BAUER
Contributing Editor
W. T. KLUSSMAN
Secretary
RAY L. SMITH, JR.
Circulation Manager
FRANK J. CORNYN
Production Manager

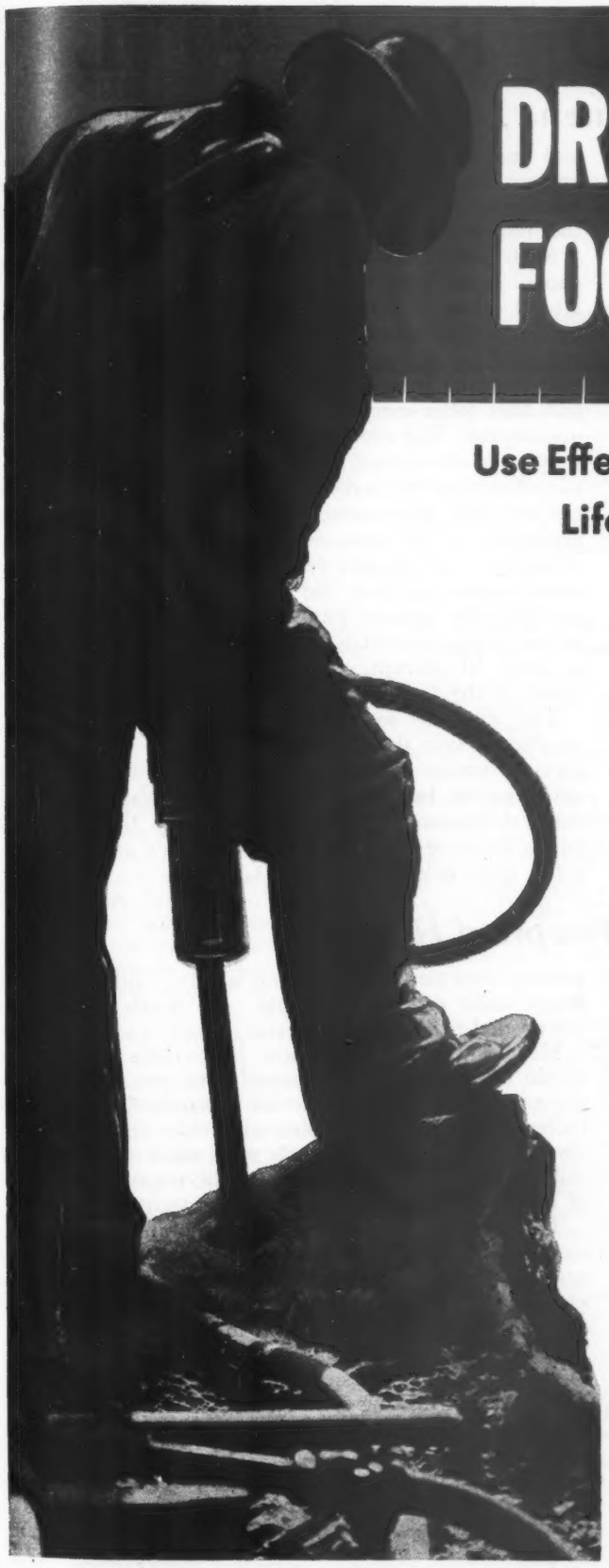
●

CHICAGO BUSINESS OFFICE
538 South Clark Street
Chicago 5, Illinois
Telephone HARrison 8558
EARL C. KAYE
Representative
RUSSELL L. MILES
Representative
GEORGE P. GRANT
Representative

NEW YORK OFFICE
Room 1235, 101 Park Avenue
New York 17, New York
Telephone CAledonia 5-4438
W. A. WILSON
Eastern Advertising Manager
CHARLES H. BUSSMANN
Assistant

CLEVELAND OFFICE
712 The Arcade
Cleveland 14, Ohio
Telephone CHerry 4432
D. R. EGBERT
Central Advertising Manager

PACIFIC COAST OFFICE
318 North Lockhead Avenue
Whittier, California
HARRY F. UTLEY



DRILL GREATER FOOTAGE at Lower Cost

Use Effective Lubrication to Increase Drill Life and Reduce Maintenance Cost

You can't buy more effective lubrication than Texaco Rock Drill Lubricants (E.P.) — and those letters "E.P." are an important reason why. They mean the oil has Extreme Pressure properties . . . extra high film strength to protect drills under the toughest conditions.

In addition, Texaco Rock Drill Lubricants (E.P.) flow readily at all temperatures, resist oxidation, cling protectively to moving parts and reduce wear. They prevent rust and corrosion whether drills are running or idle.

This all-around protection keeps drills running smoothly and on the job longer, with less downtime for repairs and overhauls. That's why operators and drill doctors everywhere prefer Texaco Rock Drill Lubricants (E.P.) and why leading rock drill manufacturers approve them.

Call on Texaco Lubrication Engineering Service for helpful suggestions on drill operation and maintenance. Contact the nearest of the more than 2300 Texaco distributing plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

KEEP COMPRESSOR VALVES CLEAN

Here, too, effective lubrication is vital. *Texaco Alcaid, Algol and Ursa Oils* provide effective lubrication, prevent hard carbon formations, keep valves clean and active, rings free, ports open and air lines clear. Your Texaco Lubrication Engineer will recommend the right one to keep your compressors running right — efficiently and economically.

TEXACO

TEXACO Lubricants and Fuels

Tune in . . . TEXACO STAR THEATRE presents the NEW TONY MARTIN SHOW every Sunday night. See newspaper for time and station.

EDITORIAL

Budget Cutting Threatens Liming Program

AN INDUSTRIAL phenomenon of recent years was the rapid growth of the agricultural limestone industry into what is now one of the most important of the nonmetallic minerals industries. Although agstone had been used to some extent for many years its growth really began when the AAA was formed to conserve our dwindling agricultural resources. In 1944 the production of agstone reached a peak of nearly 25 million tons but has since remained somewhat below that level in spite of definite proof that more than twice as much is needed annually just to maintain the present fertility of the soil.

There are several reasons why agstone production and use has never reached the 50 million ton level which will conserve our soil for the future, but the most important of these is the fact that a very large percentage of our farmers, including many tenant farmers, will not use agstone even when it is given to them free of charge. Slow but definite progress has been made, by what is said to be the most extensive educational program ever undertaken, in educating these farmers and the public up to the need for conservation practices.

This entire conservation program has been financed by an annual appropriation of $300,000,000. With this sum it has been possible to cut to less than half the former 4 billion dollar annual loss in land, food and other values. Now the latest advices from Washington indicate that this entire program is in jeopardy. In the budget submitted by the President to Congress in January an appropriation of $300,000,000 was recommended for the 1947 program and one of $200,000,000 for the 1948 program. It now appears that Congress, in its present budget-reducing efforts, may drastically cut the 1947 appropriation and further reduce or even eliminate entirely the 1948 allottment.

Such action would nullify much of what has been gained in the fight against soil depletion at a time when all-out effort is necessary to rebuild soils deteriorated by our war-time effort to feed the world. The health and welfare of present and future generations requires that essential mineral elements be restored to the soils, and that other conservation practices be continued uninterrupted. The even partial withdrawal of government support of this program would be disastrous as the very fact that over 90 percent of the agstone spread is purchased with government assistance is proof that such assistance is still necessary. The answer is a gradual withdrawal of support from agstone in favor of other conservation practices and this had already been begun. In 1945 the farmers paid only 20 percent of the cost of the liming materials used. In 1946 the average was at least 30 percent, and about 40 percent was to be asked of the farmers in 1948.

The national associations of agricultural limestone producers have done everything possible to bring Congress to realize the importance of this program to the entire nation but this may not be enough. Every agricultural limestone producer and every farmer should advise his congressman of its importance at once. Even a few days' delay may be too late.

Why Not Build Fireproof Houses?

ONE OF THE most misunderstood words in the English language is the word "fireproof", especially when applied to buildings. Newspapers, magazines, builders, and others who also should know better have prattled wisely for many years about fireproof buildings, particularly hotels, implying that a person in such a building is safe from fire hazards. The false sense of security created by the misuse of this word has already cost many lives. In insurance circles a fireproof building is defined as a structure that will withstand several hours of fire without crumpling and Webster says the same thing in more words. Under this definition only a small percentage of the buildings in this country can even be designated as fireproof. Fire-resistant is the term which should actually be used for the best of them and the others range on down to fire traps. A shamefully high percentage are in the last-mentioned category.

According to insurance records 272 people died in hotel fires in 1946 in the United States—an all-time high. Various types of business buildings, apartment houses, theaters, night clubs, hospitals, schools, etc., also contribute to the total of over 10,000 lives lost in fires each year.

It is in fires in individual houses, however, that most of the loss of life and financial loss is incurred. Hardly a day passes without some items in the newspapers telling of whole families wiped out by such fires. It is in these houses also where most can be done to cut down this frightful and unnecessary loss, by making them fireproof or at least fire resistant.

The average house today, whether old or new, has a monolithic concrete or concrete block basement which is definitely fireproof. From there on up, however, the average structure is a potential bonfire, with its wooden floors, walls, ceilings and roofs. No interior decorations are needed to create an inferno in such a structure.

How much safer and how little more expensive it would be to continue the use of concrete at least up to the eaves of a house and to use concrete floors. In flat-roofed houses the roof joists and slabs can also be of concrete and for gabled roofs steel trusses and concrete slabs can be used. Such dwellings also require a minimum of combustible materials for interior decoration.

The first cost of such a concrete structure might in some sections slightly exceed that of a wooden house. Any extra cost would be repaid in a few years' time by the saving in insurance premiums alone. Such buildings also are termite-proof, easier to heat in winter, cooler in summer, cheaper to maintain, etc., giving them advantages in any climate. Processes and methods constantly being developed are making concrete houses cheaper and better and mass-production is all that is needed to bring their cost down still further.

Producers of aggregates, cement, ready-mixed concrete, concrete products, etc., should take advantage of the present public awareness of fire losses and hazards to promote the increased use of concrete in houses in their communities. With heavy building construction being sidetracked for home construction such efforts may help to keep production at high levels now and provide for vastly-expanded future demand.

Walter E. Trauffer

PIT AND QUARRY

CHICAGO APRIL, 1947

Creedon Report Indicates 661,900 Units Built in 1946—Many beyond Vets' Budgets

Housing Expediter Frank R. Creedon's monthly report for January states that 1,003,600 dwelling units were placed under construction in 1946 and that 661,900 of these were completed. (The goal set by the Veterans Emergency Housing Program for 1946 was 1,200,000 started, without a deadline for completion.)

This volume of home building was accomplished in a year marked by severe material shortages and work stoppages in basic industries. The dollar value of new housing in 1946 was nearly five times that of 1945; and the fourth quarter of 1946 exceeded the first by 123 percent.

Although ceilings on sales prices and monthly rentals kept prices below the level they might otherwise have reached, much of the new housing in 1946 was beyond the budgets of many veterans. The average sales price of all new permanent dwellings built under the priority system topped the average cost estimated by vets as reasonable by $2,000; the average rental in such new units exceeded the estimated rent figure by $16.

International Harvester Co. To Cut Equipment Prices

The International Harvester Company has announced that price reductions are to be made which will save users of its products approximately $20,000,000 a year. The reductions, effective April 1, will apply to a selected list of products in the company's line of tractors, farm machines, motor trucks and industrial power equipment.

According to John L. McCaffrey, president of the firm, the list of products which will be affected will be announced later, with the amount of reduction on each.

Diesel Conference Planned For College Instructors

An intensive one-week educational conference for college and university professors who teach courses in diesel engineering has been announced by the Diesel Engine Manufacturers Association at its Chicago office.

During the week of June 23, instructors from all sections of the country will convene at Chicago's Hotel La Salle. Laboratories to be visited include those of the Illinois Institute of Technology and Northwestern University; and factory tours will be arranged for at the General Motors plant at LaGrange, Ill., and the International Harvester Company in Chicago.

M. A. Eiben Dies of Heart Seizure in California Mine

The many friends of M. A. (Mike) Eiben, president of the Northern Blower Co., Cleveland, O., were shocked to hear of his sudden passing on Friday, March 7. After attending the conventions of the National Sand and Gravel and Ready Mixed Concrete Associations at Los Angeles he visited his gold mine at Academy, near Modesto, Calif., where he was seized with a fatal heart attack. Big genial Mike will be missed by his many friends and business acquaintances, especially in the cement, crushed stone and metal mining industries, where he had wide contacts. The editorial staff of PIT AND QUARRY mourns the loss of an old and good friend. Funeral services were held March 15 in Cleveland.

Frank Kaul, manager of the Blue Rapids Gravel Company, Blue Rapids, Kan., has announced the official dissolution of the company. All equipment of the 20-year-old firm will be sold.

Coming Events

May 5-8, 1947—Hot Springs, Va. 29th annual convention, National Lime Association, The Homestead.

May 14-16, 1947—Hot Springs, Va. 12th annual meeting, National Industrial Sand Association, The Homestead.

June 16-20, 1947—Atlantic City. 50th annual meeting, American Society for Testing Materials, Chalfonte-Haddon Hall.

Costly Allis-Chalmers Strike Ends as W. Allis Workers Vote to Return

The 329-day strike at the Milwaukee, Wis., plant of the Allis-Chalmers Manufacturing Co. was called off on March 23 by a three to one vote of members attending a mass meeting called by Local 248 of the C.I.O.-United Auto Workers. Only about 1,500 workers voted, but about 3,000 workers are expected to go back to work as a result of the vote. Some 6,000 production employees have previously returned to their jobs at the big plant, which has been partially in production for several months.

During the long bitter strike, strikers are said to have lost an estimated $20,000,000 in wages, while the company lost approximately $65,000,000 in production volume. Other costs to the community, for police expense, taxes, vandalism and loss of purchasing power will boost the cost to over $100,000,000.

When the strike was called, on April 30, 1946, approximately 11,000 workers walked off the job. The strike's end, with the small turnout at the back-to-work vote, amounts to unconditional surrender on the part of the union, since members go back to work without a contract. This means no closed shop, and also means that the 25 cents an hour increase and revised grievance procedure previously demanded have evidently gone by the board. The company has announced that those who go back to work will receive the current pay scale, which is 13½ cents higher than the scale in existence when the strike was called. This is the increase that was offered by the company before the strike, and the increase that was accepted by the independent unions at the Milwaukee plant. The average hourly wage at the plant is now $1.21 an hour.

Six other company plants have returned to work on basically the same terms after strikes of shorter duration. The seventh company plant, in California, did not go out on strike. At the time of its abandonment, the Milwaukee strike was the oldest major strike outstanding in the country.

Walter Geist, president of Allis-Chalmers, expressed in a letter to the strikers his "fervent hope and prayer" that this "marks the beginning of a new era which will bring peace and prosperity to both you and the company."

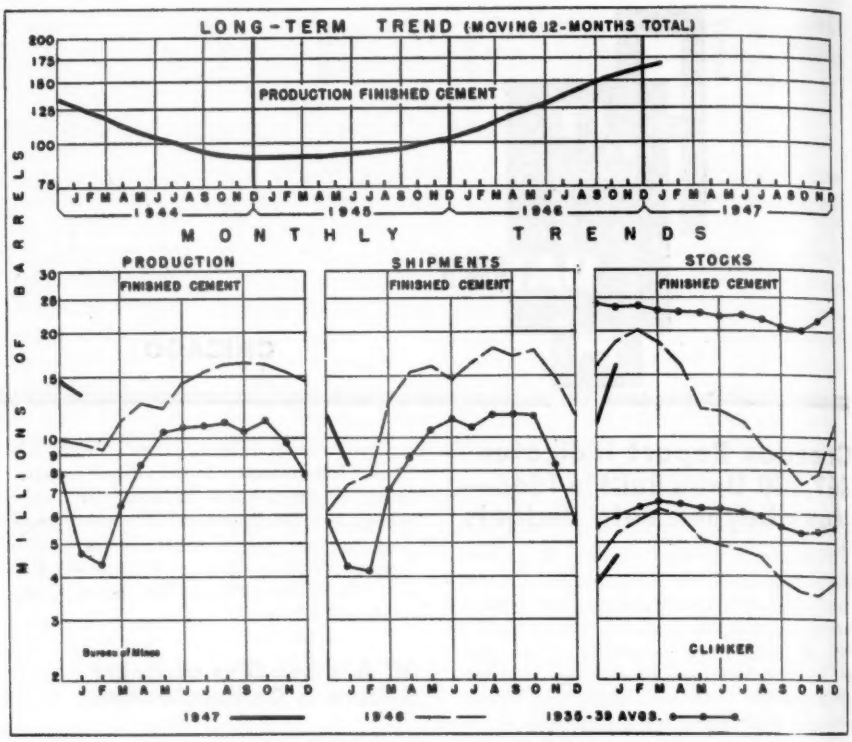
Formal Dedication of $160,000 A.S.T.M. Building Held in Philadelphia

The Headquarters Building of the American Society for Testing Materials, located on Philadelphia's Parkway at Logan Square, was formally dedicated at exercises held on February 26. Dr. G. H. Clamer, senior living past president presented the building on behalf of the membership to A.S.T.M. president Arthur W. Carpenter. Representatives were present from other national societies, the City of Philadelphia and industry.

The purchase and enlargement of the building was made possible through gifts from the A.S.T.M. members totaling about $160,000. The building is a four-story structure adjacent to the Academy of Natural Sciences. Improved working facilities are provided for the Society's staff of 43 and the building has enhanced lobby facilities, members lounge, three committee rooms for smaller meetings, and shipping and storage facilities.

One of the fifteen living original members of the society, and a past president and honorary member, Dr. Clamer, president of Ajax Metal Co., reviewed briefly some of the early A.S.T.M. history, referring to the first president, Charles B. Dudley, and the first secretary-treasurer, Edgar Marburg.

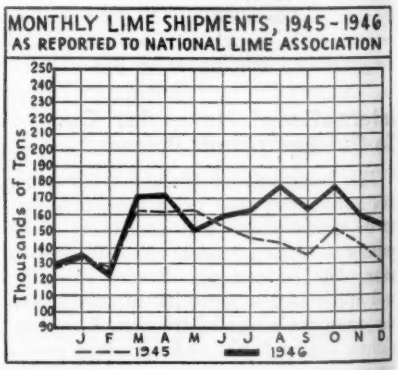
• A view of the A.S.T.M. building in Philadelphia and (bottom) the unveiling of the dedication tablet.



Production of 13,353,000 barrels of cement in January, 1947, reported to the U. S. Bureau of Mines, was 39 percent above that reported for January, 1946. Although the January, 1947, total represents a decrease of 8 percent below the December, 1946, figure, it still remains far above the usual seasonal trend. Sixty-six percent of capacity was utilized, a figure 19 percent above that reported for January, 1946. Mill shipments reached 8,363,000 barrels, an increase of 13 percent over that reported in January, 1946. Stocks of 15,911,000 barrels on January 31, 1947, are 15 percent below the amount for January, 1946, but follow the usual seasonal upswing in the winter months. Clinker production of 14,216,000 barrels in January, 1947, shows an increase of 35 percent over the figure reported in January, 1946.

Demand for cement in January, 1947, as indicated by mill shipments, although 27 percent below the December, 1946, figure, is considerably above the 1935-39 average. Nine districts report decreases ranging from 2 to 28 percent from the January total of the previous year, and ten show increases of 5 to 47 percent. Operations at the plant in Hawaii ceased on December 14, 1946.

Raymond B. Ladoo has announced the discontinuance of his grinding and pigment business, operated as R. B. Ladoo Co., in order to devote his entire time to consulting engineering in the industrial mineral and chemical fields. Special attention will be given to the Pacific Coast and the Pacific Northwest. Mr. Ladoo's address is 42 Huntington Road, Newton, 58, Mass.



According to data collected by the National Lime Association, 45 companies in December, 1946, shipped 153,841 tons of lime (91,919 quicklime; 62,022 hydrate). Reporting companies represent 43.9 percent of the association members' total capacity of record. Based on Pit and Quarry's estimates for the remainder of the industry, the total shipments for the month by all plants were approximately 385,478 tons. Shipments of lime by users for December, 1946, were:

Use	Quicklime (tons)	Hydrate (tons)
Agricultural	1,264	6,371
Building	10,116	29,437
Chemical	80,439	26,214
Total	91,819	62,022

Ideal Cement Co. Awards $500,000 Contract to G.E. To Equip Twin Plants

Two new Ideal Cement Company plants of Colorado and Utah, each capable of marketing more than 1,500,000 barrels of cement annually, will be electrically equipped by the General Electric Company.

Under a contract amounting to more than $500,000 GE will supply the twin plants with motors, transformers, controls and switch gear. Featuring systems of electronic controls, the equipment will be used to control and distribute the power for crushing mills and packaging and shipping plants.

The new facilities will be located in Devil's Slide, Utah, and Portland, Colo.

Iowa Agricultural Limestone Assn. Meeting in Des Moines

The Iowa Agricultural Limestone Association, Inc., held its second annual meeting at the Hotel Kirkwood in Des Moines, Iowa, on Friday, February 28 with 75 producers in attendance.

All of the members were interested in the possible repercussions of the proposed $100,000,000 cut in funds appropriated for soil conservation. In a round-table discussion of this budget slash, most of the limestone producers felt that, in view of the diminished world food supplies, drastic reduction of funds for soil conservation this year would unnecessarily prolong the starvation rations of the needy people throughout the world.

The main speaker of the day was B. J. Firkins of Iowa State College. Mr. Firkins stressed the need for increased practice of soil conservation, emphasizing that producers must not only produce quality agricultural limestone, but must urge its proper use and distribution.

Elected to the board of directors to replace three retiring members were: L. R. Falk (St. Ansgar, Ia.), Leo Bruening (Decorah, Ia.), and Lloyd H. McCabe (McCabe Lime Quarry, Knoxville, Ia.).

$5,000,000 Cement Concern Formed at Harrison, Ark.

Articles of incorporation were filed in Arkansas for a new $5,000,000 cement corporation whose proposed plant is to be located near Harrison, Ark. Officials plan to mine and process limestone, produce cement and engage in general contracting.

J. T. Grimmett, a principal stockholder, said that almost $2,000,000 of the corporation's stock had been subscribed. Other stockholders are Richard H. Godfrey of Oklahoma City; W. G. Bell, Springfield, O.; L. E. Rooney, Muskogee, Okla.; R. H. Seigfried, Tulsa, Okla.; Virgil Douglass, and W. P. Watkins, of Harrison, Ark.

At Northampton, Pa., the Universal Atlas Cement Company has announced the placing of an order for the installation of dust-collecting equipment in its local plant. The work of installing the new apparatus is expected to be completed within eight months.

Extensive Potash Beds On U.S.-Canada Boundary To Benefit Both Nations

The discovery in southern Saskatchewan of the first Canadian source of potash is considered the Dominion's most important mineral find in 20 years, according to J. L. Phelps, Resources Minister.

Domestic production of potash found in the Unity Oil Field about 100 miles northwest of Saskatoon would save the Canadian farmers large sums, since Canada annually imports more than $3,500,000 worth of potash from the United States.

The deposits lie over salt beds on a 350-mile arc extending from Regina, Sask., into North Dakota. Commerce Department officials of the United States report that although potash deposits in this country (chiefly in New Mexico) are of sufficient capacity to meet domestic needs for an indefinite period, the development of the northern deposits would make possible the building up of American reserves.

Missouri Limestone Men Organize New Association

Articles of incorporation were granted to the Missouri Limestone Producers' Association recently formed among quarrymen throughout the state to promote use of agricultural limestone.

Paul N. Doll, former state agricultural engineer, has become the association's manager, with headquarters in Jefferson City, Mo. Other officers of the association are: president, L. W. Hayes, Kansas City; vice-president, M. P. Donnell, St. Louis; and treasurer, A. R. Alvis, Butler.

It's No Punishment — If You Do It This Way

At the Royal Crystal Salt Company's mine near Redmond, Utah, modern American machinery is changing the old concept of slavery in the salt mines, favorite punishment meted out by the czars to their political enemies, to something very different.

Amid scenes of spectacular desert country, the company's employees, operating a Traxcavator equipped with a Caterpillar diesel D4 tractor, are removing 10,000 tons of salt each year from the 800-ft.-thick salt beds. The deposit stretches out over five miles through the picturesque Utah countryside.

Without the tractor and its front-end loader, the company would have to halt shipping operations for two days each week in order to clean up the mine and remove earth and rock overburden.

It's no longer punishment to work in a salt mine—not at the Royal Crystal Salt Company's mine.

• Left: A view of the salt mine near Redmond, Utah, operated by the Royal Crystal Salt Company of Salt Lake City.
• Below: The diesel-powered tractor, with its loader, is cleaning up waste and salt

Coolidge Again Elected N. S. G. A. President at Convention in Los Angeles

At the 31st annual convention of the National Sand & Gravel Association, held at Los Angeles, March 3 to 7, officers and members of the executive committee were re-elected for 1947. Richard N. Coolidge (Cumberland River Sand Co., Nashville, Tenn.), T. E. Popplewell (Fort Worth Sand & Gravel Co., Fort Worth, Texas), and H. N. Snyder (The Buffalo Slag Co., Inc., Buffalo, N. Y.) will continue to serve the association as president, vice-president and secretary-treasurer, respectively.

The members of the executive committe for 1947 are W. Agnew Bliss (Dravo Corp., Pittsburgh, Pa.), George W. Renwich (The Chicago Gravel Co., Chicago, Ill.), Eric W. Ryberg (Utah Sand & Gravel Products Corp., Salt Lake City, Utah), and A. R. Shiely (J. L. Shiely Co., St. Paul, Minn.).

By earlier letter ballot Charles E. Brady (B. V. Hedrick Gravel & Sand Co., Lilesville, N. C.), and E. J. Goes (Koehring Co., Milwaukee, Wis.), were newly elected to the Board of Directors, the former as member at large and the latter as representative of the Manufacturers Division.

For a complete report of proceedings at the 31st annual convention, including photographs of many of the officers, please turn to page 59 of this issue.

International Harvester Sponsors Equipment Exhibit

A complete exhibit of all types of power and equipment for earth-moving and construction was reviewed on February 12 by 400 industrial equipment distributors at Melrose Park, headquarters of International Harvester's industrial power division. Thirty-two manufacturers had machines on display in addition to International's complete line of crawler tractors, industrial wheel tractors, and diesel and gasoline engines. All of the equipment shown consisted of machines mounted on International crawler or wheel-type tractors or self-powered equipment built by manufacturers using International power.

On display was the new, large UD-24 diesel power unit utilizing the TD-24 engine. Other new International equipment included a gearless highway mower and an experimental four-wheel high-speed dirt-hauling tractor.

New equipment shown by other manufacturers included a high-speed two-wheel tractor with dirt wagon, and a four-wheel drive tractor having a crawler-type chassis and crawler controls.

UD-24 diesel power unit, and other machines, at International exhibit at Melrose Park.

Halliburton Company to Have New Distributing Center

The Halliburton Oil Well Cementing Company of Duncan, Okla., has announced plans for constructing a $100,000 cement distributing center north of Lake Charles, La. The new facilities will serve expedite deliveries of products to oil well to sites.

A tract has been purchased, and engineering work and surveys are under way. Actual construction of the plant is expected to be started in the immediate future.

The advertisements in Pit and Quarry give you a lot of practical information you can put to practical use. Make it a habit to read them carefully. This is what one reader says about Pit and Quarry:

"Valuable information and ideas are obtained by reading the advertisements in your publication. Pit and Quarry is read by a number of people in this organization and we read the advertisements, too. One of the best ways to keep abreast of the times is to study the advertising for what is new in equipment, methods, etc."

"Permanente Silverbow" Undergoing Reconversion At Kaiser Shipyards

The 10,800-ton ship *Silverbow Victory* purchased from the Maritime Commission by Henry J. Kaiser's Permanente Steamship Co. is now being converted at Kaiser's Swan Island shipyard to a carrier of cement, rock and similar bulk materials. The vessel has been renamed *Permanente Silverbow.*

The ship's unloading capacity will be 2000 barrels of cement or 500 tons of crushed rock per hour. Dust-arresting equipment will not only save many tons of material from being wasted through dissipation into the atmosphere but will also safeguard the health of workmen and prevent damage to machinery.

Kaiser Engineers, Inc., made the designs for the conversion, purchased materials and are supervising construction, with Einar T. Larsen as project engineer. The job requires the removal of practically all topside gear including king posts, booms and winches, and the substitution of tripod masts fore and aft to support the conveyor booms, which can be swung over the side for easy unloading.

The first platform and second deck are being removed to make the entire hold space available for cargo. Tunnels, enclosing scrapers, will be installed on the bottom of the cargo holds to move the cement and rock to hoppers for easy discharging.

Huron Portland Cement Company Honors Employees

The Huron Portland Cement Company honored 156 employees who had 25 or more years of service with the company. The ceremonies, which were held in the Memorial Hall, Alpena, Mich., also marked the 40th anniversary of the company.

Those receiving awards included the following: P. H. Townsend, vice-president and general manager; C. L. Laude, general sales manager; W. G. MacDonald, Alpena plant superintendent; and C. P. Harris, mill manager.

Correction

We regret that due to insufficient information we listed incorrectly the official staff of Pacific Coast Aggregates, Inc., whose current operations were described in the February issue of PIT AND QUARRY (page 83). The list should have read as follows: H. K. Humphries, president; E. J. Goodpaster, vice-president and general manager; Donald Meek, vice-president in charge of sales; W. L. Neil, secretary-treasurer; R. K. Humphries, assistant general manager; J. D. Kaufman, operations manager; H. W. Esry, sales manager, Distribution Division; R. L. Robinson, sales manager, Aggregate Division.

The Kentucky Rock Asphalt Company has announced that it plans soon to complete the consolidation of its three offices at Louisville, Bowling Green, and Brownsville in a new structure it has built in Brownsville.

January-February Volume Of Home Building Shows Big Gain over 1946 Figure

Contracts awarded for residential construction in the 37 states east of the Rocky Mountains totaled $465,810,000 during the first two months of this year, as against $191,794,000 during the corresponding months of 1946, it was reported today by F. W. Dodge Corporation.

The total number of dwelling units called for in the January-February contracts was 60,846, as compared to 26,103 in the first two months of last year. Eight percent of these contracts, in dollar volume, were for publicly-owned housing projects.

A sharp relative increase in apartment projects was noted during the first two months of this year, the number of dwelling units therein totaling 16,922 against 5,572 units in such projects during the comparative period of last year.

Single-family dwellings erected by operative builders for sale or rent constituted the biggest volume this year, with 35,456 dwelling units called for in the first two months, as compared to 15,119 in this classification in the corresponding period of last year.

Federal controls on nonresidential construction are reflected in the drop from $438,185,000 in January-February, 1946, to $343,570,000 in the first two months of this year.

Lack of Shipping Space Creates N. Y. Cement Surplus

A flood of complaints has been received by the Department of Commerce from cement manufacturers who state that they are unable to get shipping space out of New York, despite heavy demands for their product from abroad. Shipping firms are reportedly unwilling to accept cheap cargoes such as cement during the present shortage of bottoms, with more profitable commodities available.

As a result of this condition a surplus of cement is piling up in New York warehouses, said officials of local cement firms. One company stated that from 20 to 30 carloads of cement per day could be sent abroad if shipping space could be secured.

Texas Producers Organize Agricultural Limestone Group

A profitable session was reported by those attending the first meeting of the Texas Agricultural Limestone Association at the Hotel Adolphus in Dallas on February 3.

Highlights of the meeting were addresses by Henry A. Huschke, managing director of the agricultural limestone division, National Crushed Stone Association, and W. N. Landess, chief of the program exposition unit of the Tennessee Valley Authority.

Officers of the association included the following: President, Tom Wortham; vice-president, W. S. Tyler; secretary-treasurer, R. M. Morehead.

Williams G. Riley, chairman of the board of directors of the Indiana Limestone Company, Inc., has been named president and general manager of the company.

He succeeds Clarence E. Ehle, who resigned recently.

Mr. Riley also announced that Lee E. Donaldson had been chosen vice-president in charge of sales and stone production. Mr. Donaldson formerly was president of the company, having resigned because of poor health.

A.S.T.M. Technical Group Meetings in Philadelphia Attended by 1260 Members

More than 250 meetings of the American Society for Testing Materials Technical Committees, attended by 1260 persons, were held in Philadelphia during the week of February 24. Tentative specifications and test methods were reported and numerous revisions in existing standards were discussed.

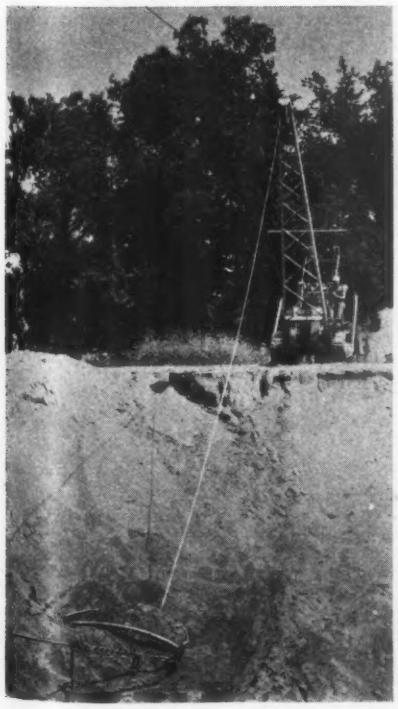
Committee C-7 met on February 25 and considered the question of a master specification for the chemical lime industries. It was voted to review and revise the existing specifications and to ask the subcommittee on these matters to consider the formulation of tentative specifications for use in some of the other industries using chemical lime.

Several of the revisions of existing standard specifications dealing with chemical analysis of limestone, quicklime, and hydrated lime (C 25-44) and of definitions (C 51-44) were voted to letter ballot for advancement to standard.

The committee considered the report of a subcommittee on by-laws, reviewed the tentative draft and voted to send it to letter ballot of the entire committee with corrections made at this meeting. These new by-laws place certain restrictions upon members of C-7, so as to make sure that all members participate in the deliberations and activities of the committee.

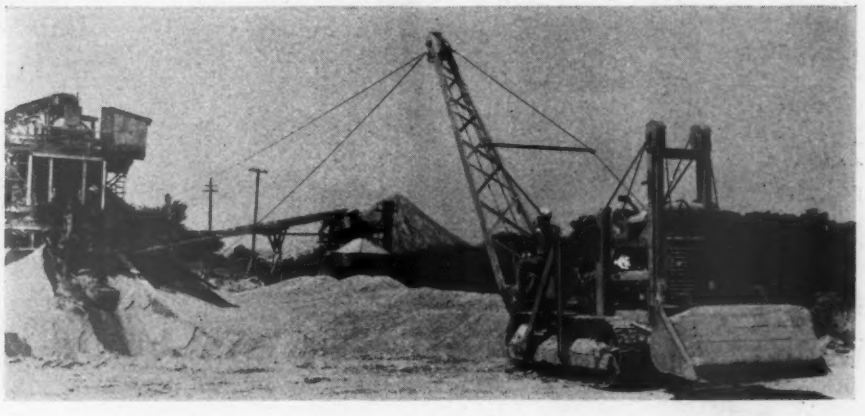
The annual A.S.T.M. meeting will be held in Atlantic City in June.

A fire at the Murray rock crushing plant near Mound City, Kan., during January resulted in damage to buildings and equipment estimated at more than $7,000. The fire broke out as workmen were warming oil in one of the motors.



• Right: The Peoria Concrete Construction Company's "Caterpillar" diesel D4 tractor, equipped with a Trackson Traxcavator, here is stripping 6 feet of overburden in a gravel pit near Peoria, Ill. Approximately 190 cubic yards of material is removed on a 200-foot haul in one 9-hour day.

• Left and below: A "Caterpillar" diesel D4 tractor, teamed up with a Hyster donkey and crane, and a Trackson Traxcavator, store classified aggregate at the Western Sand and Gravel Co., Spring Valley, Ill. They also move sand and gravel to the washing plant. The cable on the dragline is 360 feet long.



Eastern Rock Products Co. Steps Up Output, Cuts Costs With New Trailers

The Eastern Rock Products Co., recently effected important operating economies at its Oriskany Falls, N. Y., crushed limestone plant when it replaced two of four old end-dump trucks in the quarry with two new Easton TR-13 semi-trailers. A third trailer is on hand awaiting the delivery of a third tractor-truck. With this equipment more stone is being produced than ever before in the history of the company.

The high-calcium limestone is being loaded at the face by two 1¾-cu.-yd. shovels, a Marion 37 and a Link-Belt No. 55. The two units now in use have International K-8 tractor trucks with special rear ends. The third unit will be an International K-10. Each of the two units is averaging 18 tons per load and the haul is 3,000 feet one way with no appreciable grade.

This equipment has not only increased the capacity of the plant, but has also cut down the work week. Now, in a 61-hr. week, production is averaging well over the volume formerly attained in a 66-hr. week. When the third trailer goes into service and a few changes are made even higher output is expected.

The new Easton HE-16 automatic electric hoist at the crusher, which dumps the trailers, has also contributed to the increase in output. This new equipment fits in very well with the primary crusher feeder previously installed. This apron feeder is 48 in. wide with its head and tail shafts on 12-ft. centers, long enough to provide a steady feed to the crusher between load arrivals. The feeder slopes back 15 deg., an important factor in providing a uniform flow of stone to the crusher. This slope also helps to turn long slabby pieces so that they will enter the crusher properly. The 60-in. belt conveyor, which carries away the primary crusher product, extends back under the feeder and carries away any fines which may sift through the pan openings.

President's Housing Figure For 1947 Called "Too High"

Repercussions of President Truman's economic message to Congress were heard among housing experts in Washington. Specifically, the members of Housing Expediter Frank R. Creedon's staff declared Mr. Truman's statement that 1,000,000 new homes could be built during 1947 over optimistic.

The housing specialists believe that not more than 825,000 homes can be begun if federal controls and financial aids are continued in full force, and a smaller number if these should be dropped. They point out that higher costs, materials scarcities and other vital factors preclude the realization of Mr. Truman's estimate.

Lehigh Cement Traffic Chief Tells Senators Car Shortage May Close Eastern Plants

Further curtailment of available box cars may force cement plants in eastern Pennsylvania to lay off workers, E. S. Gubernator, traffic manager of the Lehigh-Portland Cement Co., recently declared at a U. S. Senate subcommittee meeting inquiring into the problem. He stated that the supply of box cars has been critical for several weeks at all three of the company's local plants—Sandts Eddy, Ormrod and Chapman.

Mr. Gubernator pointed out that the Sandts Eddy plant, which produces 35,000 barrels of cement weekly, may be forced to close unless shipments are speeded up. Hopper cars are providing some relief. The Chapman plant requires 35 cars daily to care for production, but only about nine a day are being received from the Reading Railroad.

• Below, left: A 1¾-cu.-yd. shovel loads a semi-trailer at the quarry of the Eastern Rock Products Co., Oriskany Falls, N. Y. Right: The load of rock about to be dumped by an automatic electric hoist.

• Bottom panorama: A view of the quarry and plant, showing (background, left) operations at the quarry face and a loaded tractor truck (foreground) going to the crusher.

Trade Commission Takes Fight With Cement Firms To U.S. Supreme Court

The Supreme Court has agreed to review Federal Trade Commission findings that numerous cement producers had conspired to restrict competition by the use of a delivered price system. The Justice Department asked that the court review the findings and reverse a decision of the U. S. Circuit Court in Chicago.

"Throughout a long period," the department said in a brief filed with the high court, "the cement industry has evinced a strong aversion to competition. The belief is held generally that free and open competition is impracticable for this industry and that no producer should attempt to excel others in quality, price, or terms of sale.

Those named in the commission order included the Cement Institute, Aetna Portland Cement Co., Marquette Cement Manufacturing Co., Calaveras Cement Co., Huron Portland Cement Co., Superior Portland Cement, Inc., Northwestern Cement Co., Riverside Cement Co., Universal Atlas Cement Co., and Monolith Portland Cement Co.

Louisiana Expects to Spend $39,000,000 on Roads in 1947

Louisiana highway construction plans calling for the expenditure of nearly $39,000,000 during 1947, more than three times the amount spent last year, were disclosed by P. A. Frye, state director of highways.

It was pointed out that more than $22,000,000 of the total is available in federal funds, including a balance of $7,139,743 remaining of the regular and emergency allotment to Louisiana prior to the new federal highway act.

Army's Retired Iron Horse Serves Well in New Duties

"Hortense" is doing her stuff these days at the Roscoe, Calif., plant of the Consolidated Rock Products Co. of Los Angeles.

She is a 30-ton Plymouth locomotive, so named by the men of the U. S. army air forces when placed in service at the Santa Ana, Calif., air base shortly before the end of the war. The California producer purchased the unit, almost new, from the War Assets Administration, at a recent sale.

A modern all-steel batching plant is being erected at the Slauson Avenue bunkers of the company. It replaces an old plant which had been in service for a number of years.

Big Inch Caps Mashed But Safe in Unscheduled Test

The new Western "Big Inch" blasting cap has survived without detonation what is believed to be one of the most unusual "drop tests" in the history of explosives.

• The Big Inch caps after the "test".

Drop, or impact tests are commonly made to determine sensitivity by dropping a known weight on blasting caps. In testing Big Inch and other blasting caps, Western engineers drop a ten-pound weight from a height of four feet.

Recently in a large mine an entire section of roof rock weighing approximately 75 tons dropped and landed on a box of Big Inch caps.

When the rock had been cleared away, the box of blasting caps was discovered completely flattened out on the mine floor. Although battered flat and misshapen, not a single cap had been detonated.

March 15 was the opening day for operations at the Loring Quarries at Bonner Springs, Kan., where a large number of heavy machinery units were recently received. Installation of the new equipment is being carried forward under the direction of Emmett Conlan, superintendent.

A.I.M.E. Members Combine Anniversary Celebration With Minerals Conference

More than 2,000 members and guests of the American Institute of Mining and Metallurgical Engineers attended the World Conference on Mineral Resources held March 17, 18 and 19 at the Waldorf-Astoria Hotel, New York, in conjunction with the 75th Anniversary Celebration of the Institute. During the remainder of the week some 200 scientific papers and reports were presented in technical sessions held at the Waldorf, the Pennsylvania Hotel and the Engineering Societies Building.

One of the features of the three-day World Conference was an entire session devoted to discussion of various aspects of atomic energy in its relationship to the mineral industries. Papers were presented on the control of atomic energy, the role of engineers in atomic development, and the application of atomic energy to industry.

At the 75th Anniversary Banquet, held at the Waldorf-Astoria on March 19, Clyde Williams was inducted as president of the Institute for 1947, succeeding Louis S. Cates. As director since 1934 of the Battelle Memorial Institute for theoretical and applied research on metals, ceramics and fuels, Mr. Williams has become one of the most widely known metallurgists in the United States. He served as head of the War Metallurgy Division of the Office of Scientific Research and Development, and as chairman of the War Metallurgy Committee of the National Research Council, which established and supervised scores of war research projects in metallurgy.

A detailed report of the technical sessions held in connection with the Institute's 75th Anniversary Celebration will appear in the May issue of PIT AND QUARRY.

Market studies on trinitrotoluene (T.N.T.) conducted by the Economic and Market Research Division of the War Assets Administration reveal a variety of possible uses for the 27,000,000 pounds of the explosive recently put on sale by WAA. It has been demonstrated to be suitable for all kinds of blasting work where 40 percent dynamite is used, practically the same results having been reported.

Old Mission Portland Cement Plant Reopened By Pacific Coast Cement

Full scale operation of the Old Mission Portland cement plant at San Juan Bautista, Calif., is to be resumed shortly. by the Pacific Coast Portland Cement Co. The plant has operated intermittently for many years, but has been closed down since 1943.

A giant diesel shovel has been delivered to the rock quarry, powder magazines have been filled and trucks, compressors, and similar equipment purchased and installed. With round-the-clock operation it is anticipated that production will be 2,000 barrels daily.

Big Pumice Mill in Operation On 1,000-Acre California Site

Ten miles north of Bishop, Calif., on a 1,000-acre site, the Insulating Aggregates Company is now in full production. Work on the 70-ton pumice proccessing mill was begun last summer, with L. B. Eaton in charge. Mr. Eaton designed the machinery and the mill and also served as construction foreman.

The property has a thick vein of pumice which is readily accessible after removal of the overburden by a bulldozer. The process of preparing the material is almost completely automatic; and the plant is electrically equipped, generating its own power by butane. The pumice is dried and reduced before it reaches the mixing bin, where a chemical is added to give it an insulating and acoustic character. Its feature of extreme light weight (one-third that of ordinary plaster) reduces the stress on buildings and therefore the tendency of walls to crack. The product is also said to be termite- and rodent-proof.

Officials report that at least 50,000 tons of pumice has been stripped from the deposits and that the supply will last indefinitely. The present mill, which represents a large investment, may later serve as a pilot mill for even more extensive operations.

G. M. M. Grant of Los Angeles is the owner of the enterprise, and F. L. Murphree is mill superintendent.

H. N. Snyder Named President Of Federal Portland Cement

The Federal Portland Cement Company, Inc., has announced the election of Leon A. Beeghly as chairman of the board of directors, Harris N. Snyder as president and treasurer, William E. Bliss as vice-president and Ronald E. Daniels as vice-president and secretary.

The company also announced two appointments—that of Albert A. Oesterle, general superintendent and Eugene C. Williamson, superintendent.

L. C. L. Freight Moves on R. R. Pallets for First Time In Shipping Experiment

Palletizing has long been thought of only in the terms of carload quantities. However, recent L. C. L. shipments over the Great Northern Railroad by Bemis Bro. Bag Co. at Minneapolis completed the first movement on railroad pallets in this country.

The shipments consisted of wire-bound bales of seamless bags which were strapped to the pallets with six bands of ¾-in. steel strapping. The total weight of the load plus the pallet and the strapping was 1950 pounds.

The bales reached their destination, Minot, S. D., in excellent condition and the consignees have expressed their approval of this type of shipment. L. L. C. shipments on pallets furnished by the railroads have definitely opened a new field for the application of modern materials-handling methods. Although the Great Northern is conducting palletizing experiments at several of its major freight terminals, the service is not yet a standard procedure on this railroad.

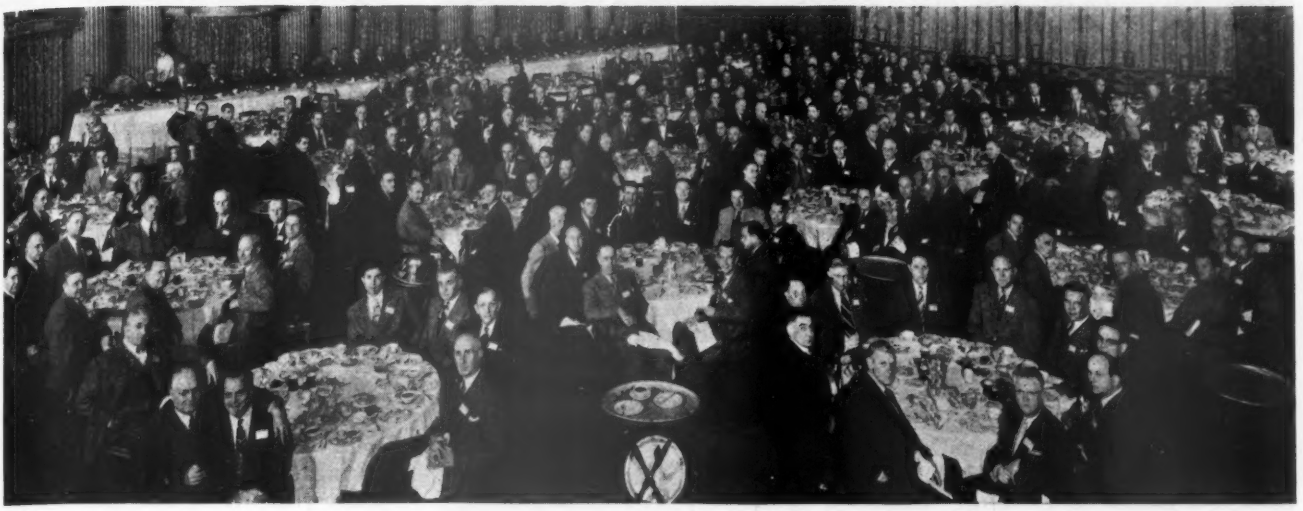
As a part of an expansion program, the Celotex Corporation has acquired the Weaver-Wall Company of Cleveland, O., makers of asphalt shingles, roofing and siding, with plants in Cleveland and Avery, O.

• A general view of the Arthur R. Alvis crushing plant near Butler, Mo. A Caterpillar diesel D4600 engine is used to power the primary plant, and a D13000 to power the secondary screening plant, with its No. 3 Universal hammermill. The Simplicity double-deck vibrating screen is powered by a Caterpillar D3400 engine. The average output is 300 tons of lime and 500 tons of crushed rock daily.

• A close-up of the Caterpillar D4600 which runs the primary crushing plant.

• Below: At the quarry a D4 tractor and a Trackson Traxcavator load a truck with limestone.

First N.S.G.A. Meeting West of Rockies Draws Crowd from All Parts of U. S.



• Scene at the luncheon of the National Sand and Gravel Assn. and the National Ready Mixed Concrete Assn. held at the Biltmore Hotel in Los Angeles on March 5.

another ON THE SPOT report

THE 31st Annual Convention of the National Sand and Gravel Association, at the Biltmore Hotel, Los Angeles, Calif., March 3-6, 1947, was the first ever held on the Pacific Coast. Held in conjunction with the 17th Annual Convention of the affiliated National Ready Mixed Concrete Association, it was also voted one of the best meetings ever held from several standpoints, among them attendance, interest and importance of subject matter, entertainment—both official and unofficial—and weather. For a very large percentage of the more than 577 producers, machinery manufacturers, etc., and their wives, it was the first trip to California and few were disappointed in what they found. The hospitality extended by the West Coast producers was in the best tradition and left nothing to be desired.

Attendance—Programs This meeting served to emphasize perhaps more than ever before the interdependence of the sand and gravel and ready-mixed concrete industries and the similarity of their aims and problems. This was evident in the fact that two of the six half-day sessions were of interest primarily to sand and gravel producers, two to ready-mixed concrete producers, and two were of equal interest to both. It was further evident from the fact that, of the 259 producers registered, 57 produced only sand and gravel, 95 produced only ready-mixed concrete, and 107 produced both. The registration list included 144 equipment manufacturers, 151 ladies, and 23 guests.

A feature of the meeting was the setting aside of an afternoon for the inspection of sand and gravel plants in the Los Angeles area. Another afternoon was devoted to the inspection of ready-mixed-concrete plants. Both field trips were very well attended.

Directors Meeting At the meeting of the board of directors on March 3, and again at the opening session of the convention on March 4, Vincent P. Ahearn, executive secretary, pointed out the excellent financial condition of the association and the very gratifying increase in membership, especially in the Western states. Stanton Walker, director of engineering, told of the research work being done and some of the plans for the future. These included the probable repetition of the short course of instruction held last year which proved to be so popular that it seems certain to become a permanent fixture. Mr. Walker's recent election to the presidency of the American Concrete Institute was also announced.

Other items of business included the appointment of a committee to determine the attitude of members on the form of the proposed ICC freight-rate increase. The sending out of a wage-rate questionnaire was also approved.

At this meeting it was also decided, in cooperation with the ready-mixed board, to hold the annual mid-year joint directors meeting at French Lick Springs, Ind., August 13-15, 1947. The first day will be devoted to the sand and gravel meeting and the last day to the concrete meeting, with the in-between day left open for golf and other pursuits.

The board of both associations reaffirmed their belief that the 1948 annual convention to be held at Cincinnati should include a machinery exhibit but agreed to leave the decision on this and on the 1949 convention up to the Manufacturers' Division which met later in the day.

Manufacturer's Division After considerable debate, members of the Manufacturers' Division at a meeting on Monday, March 3, decided to hold equipment exhibits in connection with the next two conventions, in 1948 and again in 1949. Some objection arose among the heavy-equipment men present to holding a 1948 show, inasmuch as next year's A.R.B.A. convention will be featured by the biggest display of equipment ever before attempted and, as the road shows are now on an every-other-year basis—the even-numbered years—it was felt that the aggregates industries should omit a conflicting exhibit next year and resume with 1949 on an every-other-year basis in the odd-numbered years.

However, since the crushed-stone convention next year will definitely have an exhibit at the Netherlands-Plaza Hotel in Cincinnati, and the

sand-and-gravel and ready-mixed concrete organizations will also convene at the same hotel, it was finally decided to exhibit in 1948 and again in 1949, after which the shows will be on an odd-year basis. Next year's exhibit will be the first since 1942.

Mr. Ahearn told the manufacturers of the renewed enthusiasm with which the producers are looking forward to next year's gathering because of the decision to hold the exhibit. While the associations had tentatively planned to meet at the Hotel New Yorker in New York City in 1949, the convention scene for that year will now be shifted, possibly to Chicago, Cleveland or St. Louis, due to the lack of exhibit facilities at the New Yorker.

E. J. Goes (Koehring Co., Milwaukee), was elected chairman of the Division for 1947, succeeding Abe Goldberg (Allis-Chalmers Mfg. Co., Milwaukee). Ralph C. Johnson (Simplicity Engineering Co., Durand, Mich.) was elected a vice-chairman. The other hold-over vice-chairman are: E. C. Anderson Kensington Steel Co., Chicago); Morgan Butler (Butler Bin Co., Waukesha, Wis.); A. E. Conover (Robins Conveyors, Inc., Passaic, N. J.); W. W. King (W. S. Tyler Co., Cleveland); and G. K. Viall (Chain Belt Co., Milwaukee).

Carl O. Friend (Nordberg Mfg. Co., Milwaukee), was chosen a new member of the board of directors.

The annual reception for producers by the Manufacturers' Divisions, held the night of March 5, was well attended.

Entertainment On the social side there was never a dull moment. Commencing with a get-acquainted luncheon for the ladies on opening day, there were tours of Hollywood, Beverly Hills and the palm-lined boulevards of Pasadena, and visits to the radio and motion-picture studios. As a concluding feature, many of the visitors embarked on a two-day trip to Riverside and Palm Springs, famous winter resort, where they reveled in the desert sun. An overnight stop was made at Riverside's historic Mission Inn.

President's Address Sessions of the National Sand & Gravel Associations opened on the morning of Tuesday, March 4, with President Richard N. Coolidge (Cumberland River Sand Co., Nashville, Tenn.) making his official address.

Mr. Coolidge paid glowing tribute to the members of the Southern California Rock Products Association and the Southern California Ready Mixed Concrete Association for arranging such an interesting program; reviewed the developments within the industry and the legislative and labor situation, past and present, as it affects the aggregates and allied industries; expressed official appreciation of the untiring efforts of the association's executive secretary, V. P. Ahearn, and Stanton Walker, director of research, for advancing the prestige and technical progress of the industry. He reported that important gains had been made in membership during the past twelve months, with the result that about 75 percent of the total commercial production is now represented.

Secretary's Report In his report, Mr. Ahearn discussed the pending Gwynne Bill at some length as a needed law to protect the rights of industry against labor racketeers and irresponsible official interpretation of existing regulations. He predicted the gradual abandonment of the few remaining controls on construction but warned that if the announced goal of 1,000,000 homes started and completed this year is realized, "the immediate outlook for the sand-and-gravel industry is dim indeed, as our industry depends on a balanced program of construction if it is to thrive and prosper."

The industry is still desperately in need of new equipment and repair parts, said Mr. Ahearn, and necessary projected plant expansion and rehabilitation is being held up because of the shortages. The secretary praised the gains made by the sand-and-gravel industry in accident prevention, pointing out that there were no fatal accidents of record during the entire year of 1945, the latest year for which statistics are available. Production was up about 10 percent last year as compared with 1945 and prices were somewhat improved, he said.

Engineering Report Studies in durability continue as a major phase of the association's research program, Mr. Walker reported. In this connection, experiments and field experience with air entrainment in concrete also give indications of a definite improvement in durability, he said.

The short course conducted by the association at the University of Maryland in 1946 was an outstanding success. It was so well received that Mr. Walker is planning to repeat it at least once in 1947.

Cars On the subject of car railway supply in 1947, W. C. Griffin of the Association of

• Scene at one of the convention sessions at the Biltmore Hotel.

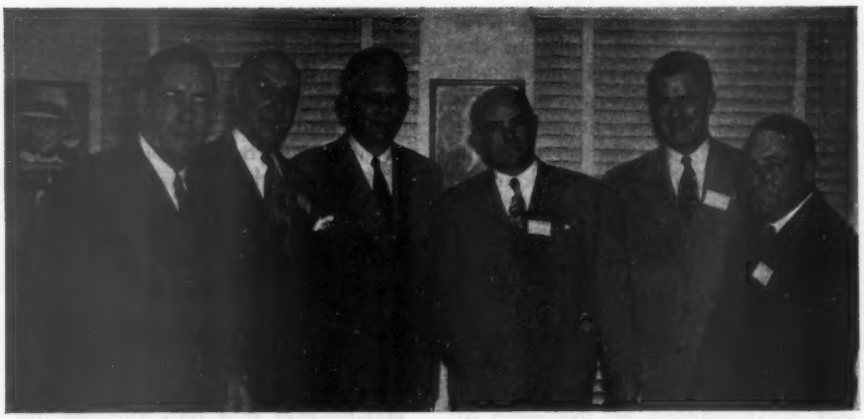
American Railroads saw little relief in the existing car shortage before another year rolls around. The box-car situation is most acute, however, because of an anticipated bumper crop of agricultural products.

The first seven weeks of 1947 saw sand-and-gravel shipments rise to 55 percent above the corresponding period of last year, but a leveling off will probably bring this down to about a 12 percent increase for the first quarter, the speaker predicted.

At least 100,000 new cars will be needed in 1947 and of these 82,000 are now on order, Mr. Griffin said. If steel allotments can be increased, a monthly production of 7,000 cars may be attained, although this will result only in a net gain of about 2,250 cars monthly since an estimated 4,750 worn-out cars will be retired each month.

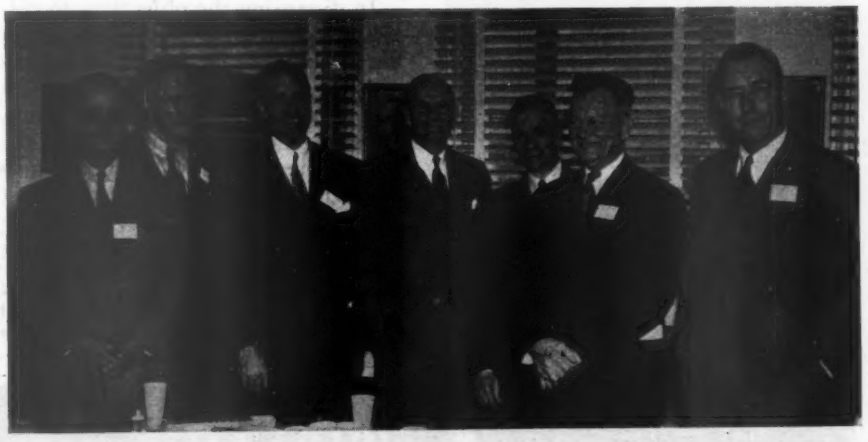
Plant Four Four chartered busses took an estimated 250 persons on a tour of sand-and-gravel plants immediately after the close of the morning session. A picnic lunch was served at the El Monte plant of Graham Bros., the first step on the itinerary. After a cursory inspection of production facilities, the tour moved on to the huge Irwindale plant of Consolidated Rock Products Co. and the new and modern plant of the Azusa Rock & Sand Co. at Azusa. This smooth-working unit, newest of the postwar plants in the west to get into production, was completely described and illustrated in the August, 1946, issue of PIT AND QUARRY shortly after it went into service. Visitors were impressed by the efficient flow-sheet and the small labor requirements of the Azusa operation.

Joint Luncheon At the joint luncheon of the two associations on March 5, Robert Mitchell (Consolidated Rock Products Co., Los Angeles) was presented with a scroll and a ring by 24 rock, sand and gravel and ready-mixed concrete producers in the six southern California counties. The scroll, which was signed by each of the 24 companies, read as follows:



• A group from southern California. Left to right. P. C. Graham, Graham Bros., Inc.; H. G. Feraud, S. Calif. Rock Products Assn.; J. D. Gregg; P. J. Akmadzich, City Rock Co.; Q. W. Best, Consolidated Rock Products Co.—all of Los Angeles; and L. H. Chandler, Chandler Palos Verdes Sand & Gravel Co., Lomita.

• An international group. Left to right: Richard N. Coolidge, Cumberland River Sand Co., Nashville, Tenn.; Stanton Walker, National Sand and Gravel Assn., Washington; M. A. Craven, Certified Concrete, Ltd., New Zealand; L. P. Price, Clarke-Halawa Rock Co., Honolulu; Harry E. Bender, Azusa Rock & Sand Co., Azusa, Calif.; Paul C. Graham.



• Above, left to right: T. E. Popplewell, Ft. Worth Sand & Gravel Co., Ft. Worth, Tex.; E. C. Knowlton, Utah Sand & Gravel Products Corp., Salt Lake City; Robert Mitchell, Consolidated Rock Products Co., Los Angeles; Eric Ryberg, Utah Sand & Gravel Co., Salt Lake City; H. V. Owens, Eastern Rock Products, Inc., Utica, N. Y.; J. Rutledge Hill, Gifford-Hill & Co., Inc., Dallas, Tex.; P. C. Graham.

• Left: W. A. Wilson and H. F. Utley, Pit and Quarry.

• Right: Jeanette E. Daley, Daley Construction-Acme Materials Co., Phoenix, and H. C. Dickson, Riverside Cement Co., Los Angeles.

"In recognition of the outstanding achievement in the interest of the Rock, Sand and Gravel and Ready Mixed Concrete Industry, both nationally and locally, accomplished by Robert Mitchell for his untiring efforts in handling the problems of these industries, and the splendid leadership he has provided as President of the National Sand and Gravel Association during two wartime years, we express to him our sincere appreciation and thanks." Mr. Ahearn presented the award.

American Problems was the subject of an address by the guest of honor, William M. Jeffers, vice-chairman of the board of directors, Union Pacific Railroad. After a few remarks regarding his efforts during the war in getting our synthetic rubber program under way, Mr. Jeffers embarked upon the theme that we must all work together to achieve economic stability and forget about "something for nothing." We must, he said, get back to the attitude of opportunity and reasonable security for all. He advocates legislation which will prevent strikes in shipping, railroads, coal mines and other public service industries and the elimination of the closed shop. According to Mr. Jeffers we must sell America to our youngsters and teach in our schools that each must contribute to society, and that we owe people only what they earn. We need, he said, more patriots and fewer politicians.

Legislation *Legislation by Congress Affecting Labor-Management Relations* was the subject discussed by Charles A. Horsky, counsel for the two associations. Mr. Horsky gave a brief but comprehensive coverage of the various legal and governmental developments affecting these industries, including the portal-to-portal pay. Legislation on these, he said, is almost sure to specify that any required extra time be regarded as work time but that this will not apply to voluntary extra time. He also believes that, regardless of which bill passes Congress, a 1- or 2-year statute of limitations will be imposed.

Pressure is being brought from all directions to bring material producers under the Walling ruling, said Mr. Horsky, and now anyone supplying anything to anyone under that act is also covered by it. He emphasized that anyone who thinks he is exempt from its provisions is taking a gamble.

On the subject of labor Mr. Horsky said that only the administration of the Wage-Hour Act can decide who is an administrative or executive employee. Regardless of anything else, such an employee must have at least one man under him and five other tests must be met. He also advised reexamination of all labor contracts, regardless of how good or how new. In closing Mr. Horsky said that as counsel for the associations his advice is available to all members.

Group Actions *Group Action by Producers in Development of Area Labor Agreements* was the subject of a paper by Richard W. Lund, counsel for the Southern California Rock Products Association. He first commented on the advantages to producers if secondary boycotts by labor unions are made illegal as this type of action has been a serious handicap to the building program.

In discussing the objections to collective bargaining he said that such bargaining eliminates a producer's right to determine his own policies and subordinates him to the group. In such bargaining also, said Mr. Lund, the unions will try to push through a contract to their best advantage with an individual producer in that area and then use this as a lever to get similar contracts from the other producers. In this way, he said, a group is only as strong as its weakest member. Also under such a setup every shutdown of industry becomes an industrial crisis which may result in government intervention. He also advised producers to watch for violations of the anti-trust laws.

Under present laws a union can now pick the producer it wants to fight and after winning over him can use this victory against the next most vulnerable producer. This, said Mr. Lund, can mean that by the time such a program reaches a really smart and alert producer it has a tremendous amount of momentum behind it. Group action is, in his opinion, the only way to stop such tactics. Under collective bargaining also he believes a union is less likely to call a strike, and the wage rates cease to be a competitive cost factor in an industry. Such a setup also makes for a freer exchange of information and leads to producer cooperation in other vital matters, but he said it is important that all producers in the area join such a group. Such a group, he advised, should be organized on a permanent basis with an office and a paid staff.

In order to be able to cope with the unions, said Mr. Lund, a producer must know and have his facts about the union and about his plant and employees, otherwise he will be at a disadvantage as the unions have those facts and use them. He also urged employers to be fair and reasonable with unions and to demand the same treatment from them. A good policy is to be firm when in the right, no matter how trivial a question may be, otherwise any such weakness will lose the respect of the union.

Mr. Lund also advised producers to conduct their businesses on the expectation of having strikes, and to set aside reserves for them as they would for bad debts, insurance, etc.

• Members of the association who visited the plant of Graham Brothers, Inc., at El Monte were entertained at a luncheon given by the Southern California association.

Meeting the unions half-way but no further and then letting them strike is the best policy in the long run if industry wants to keep unions from running it. He also pointed out that employers can and do win strikes and that such victories by employers have a good effect on the unions and on the employees.

Current Tax Problems in the Sand and Gravel and Ready Mixed Concrete Industries were discussed by Robert Ash, tax counsel for the two associations. He said that the cost of government is now so high that it can be met only by continuing to tax the low income groups. He advised the industry to attempt to get a repeal of the 3 percent tax on transportation of property for hire, which is not only unfair but is also more trouble than it is worth in revenue. Most important, however, is the fact that this tax discriminates against different types of producers. There is much room for confusion as to when and on whom the tax applies. He went into much detail on this and some examples cited follow:

Suppose you employ an independent contractor to remove the overburden or topsoil from a sand or gravel deposit. The Treasury says the tax applies if you designate the place where the overburden or topsoil is to be deposited. However, if you do not tell the contractor where to place the overburden or topsoil, the tax is not applicable. A dispute can easily arise in the situation mentioned.

Or suppose you agree to sell your product to a county at a designated point in the county f.o.b. at a stated price. You ship the product by rail to the point preparatory to their effecting the required delivery. You forward the bill of lading to the county which surrenders the bill of lading to the carrier, pays the transportation charges and receives your product. The county deducts the transportation charges from the f.o.b. price and remits the balance to you. The Supreme Court has held[1] that in the cirucumstances mentioned the transportation service was not rendered to the county but was rendered to the vendor. Consequently, the vendor was liable for the transportation tax.

If you produce sand or gravel from your own property and employ independent contractors to haul the product from the point of extraction to the point of original processing, the amounts paid for such hauling are subject to the three percent tax. Such a tax on inter-plant transportation seems to be a discrimination in favor of the producer who does his own hauling with his own employees.

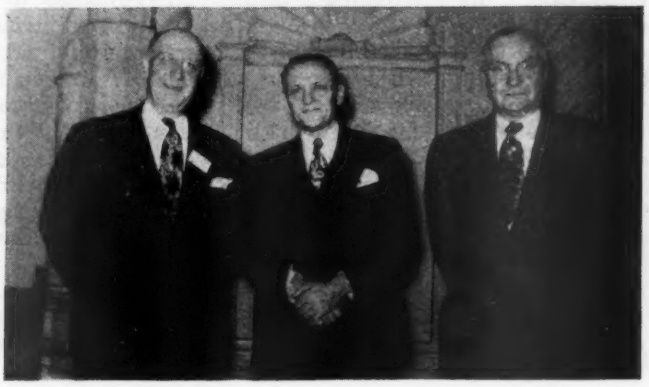
The sections of the Internal Revenue Code defining the tax impose many burdensome requirements on persons transporting property for hire. They must register with the collector, keep accurate records with respect to each individual transaction, file monthly returns and meet other requirements. These requirements have a definite deterring effect on the reciprocal use of trucks and drivers in the same area. In the past, when one producer had more business than he could handle with his own trucking equipment, he leased the trucks and drivers of producers less busy, usually on a per diem basis. The Bureau of Internal Revenue holds that unless the driver of the truck is on the payroll of the company whose property is being transported, such an arrangement constitutes transportation of property for hire and the 3 percent tax applies.

Mr. Ash then discussed the standard hauling contract which the association recommends in establishing contractual relationship with owner drivers of trucks or with trucking contractors. He emphasized its importance in insuring against possible crushing future liabilities.

Mr. Ash next described the declining balance method of computing depreciation and its advantages in some cases. In describing it he said: "Suppose that you acquire an asset which cost $1,000, has a ten year life and will have no salvage value at the end of ten years. Under the straight line method of computing depreciation you are permitted to

1. *Wheeler Lumber Bridge & Supply Co. v. U. S.*, 281 U. S. 572, 8 A.F.T.R. 10919.

• Left: Robert Mitchell, Consolidated Rock Products Co., Los Angeles; R. N. Coolidge, Cumberland River Sand Co., Nashville, Tenn.
• Right: John A. Sauerman, Sauerman Bros., Inc., Chicago; Ronald C. Griffin, Consolidated Rock Products Co., Los Angeles.
• Below, left: Fred Braun, W. S. Tyler Co., Cleveland; Mrs. Paul C. Graham; Wayne King, W. S. Tyler Co.; Paul C. Graham, Graham Bros., Inc., Los Angeles.
• Below, right: Hal G. Feraud, Southern California Rock Products Assn., Los Angeles; V. P. Ahearn and Stanton Walker, National Sand and Gravel Assn. and National Ready Mixed Concrete Assn., Washington, D. C.



deduct $100 each year for ten years.

"Under the declining balance method the amount of depreciation is subtracted annually from the cost or other basis of the property and the rate applied only to the resulting balances. Depreciation on any single item is largest in amount in the first year and declines each year thereafter. In the case of the asset mentioned in the illustration given with respect to straight line depreciation, the declining balance method would work as follows:

"Depreciation the first year would be $150 and the remaining undepreciated balance $850. Fifteen percent of $850 is $127.50, so that is the depreciation for the second year and the remaining undepreciated balance is $722.50. For the third year the depreciation allowance is $108.38 and the remaining undepreciated balance $614.12.

"The declining balance method gives satisfactory results for accounts which are constantly replaced in substantially equal amounts. The best application is to those accounts for property in which the greater proportion of the product is confined to the early part of the useful life.

"I think individual members might investigate the possible advisability of the use of the declining balance method. However, I think you should move slowly before adopting this method and you should do so only if the figures in your particular case show a definite advantage. My reason for advising caution is my firm belief that when the Congress undertakes a complete revision of the Internal Revenue Code it will provide for accelerated depreciation of new assets. This proposed plan is that 50 percent of the cost of new assets be recovered on the straight line basis over the first 25 percent of the asset's useful life. The proposal has the approval of the Treasury Department and the Joint Congressional Committee on Internal Revenue Taxation. Within the coming year we should have a general revision of the Internal Revenue Code. In my opinion, you should watch the situation and not change to the declining method of computing depreciation until you see what Congress is going to do to the depreciation provisions in the new law."

On the subject of percentage depletion, Mr. Ash advised that the sand and gravel industry attempt to secure enactment of a provision for such an allowance. "As you know," he said, "the computation of depletion in the case of natural resource industries has presented an administrative problem to the Bureau and has placed a difficult burden of computation on the taxpayers. Consequently, the 1926 Act gave oil and gas producers the option of using either cost depletion or percentage depletion. The rate of percentage depletion is 27½ percent of the gross income from the property, but such deduction may not exceed 50 percent of the new income from the property.

"In later acts percentage depletion was extended to other natural deposits. Thus, a 15 percent rate applies to metal mines, fluorspar, flake graphite, vermiculite, beryl, feldspar, mica, talc, lepidolite, spodumene, barite, ball and sagger clay or rock asphalt mines and potash mines or deposits. A 23 percent rate is allowed sulphur mines or deposits."

In endorsing the proposed uniform accounting system for the industry, Mr. Ash said: "In attempting to assist these industries with their tax problems I have been impressed with the need for some sort of a uniform or standard system of cost accounting. In many instances claims for excess profits tax relief under section 722, 735 and other sections will be denied because the tax-paying company does not have adequate records to show what it did in the base period years of 1936 to 1939, inclusive. If taxpayers do not have such records it is obvious that when fixing the price of their product they cannot know the amount of their profit. In fact, their prices may not result in a profit if all proper costs were considered. I make this statement because, astonishing as it may seem, one fairly sizeable producer in this industry does not take depreciation of his equipment into account when figuring his supposed profit.

"A simple cost accounting system could be devised which would be industry wide in its application. Such a system probably would not fit exactly into the operations of all companies, but it would surely assist all companies to take into account all the real items of cost. Such a system would aid in determining tax liability and, in my opinion, would pay for itself in tax savings. In addition it would furnish various producers with a knowledge of costs which would permit them to bid for business in the light of actual costs.

"In the ice cream manufacturing industry such a uniform system of cost accounting has been devised. The trade association in the industry undertakes to study particular plants and install the uniform system of accounting in the particular plants desiring it. The cost of the analysis and installation of the system in any particular plant is, of course, borne by that plant. As a consequence the ice cream manufacturing industry has particularly fine statistics. These statistics are broken down into a series of reasonable cost classifications. They are assembled and published for the industry as a whole and also broken down into appropriate geographical groups. By watching these statistics a particular operator can tell if his costs are in line with the industry. If not, he can investigate to determine how he can bring his operation into line. The ice cream manufacuring industry has one thing in common with our industries. It is a 'short haul' industry in which competition is localized and not nation-wide."

The members gathered voted unanimously that the associations take steps to adjust and carrry out Mr. Ash's three suggestions on the transportation tax, percentage depletion, and cost accounting.

Granular Bases The utilization of products of the sand-and-gravel industry for granular bases in highway construction was discussed in a paper by Harry D. Jumper, engineer, Consolidated Rock Products Co., Los Angeles. The various combinations of aggregates which may be used, their comparative values, production methods employed and test methods in use by his company, were well covered by Mr. Jumper.

The first realization of the stability of granular materials for roadway bases came from their use as service roads around aggregates plant, Mr. Jumper declared, although it was not until 17 or 18 years ago that production began in a commercial way. Extensive investigation by the California Division of Highways into the possibilities of the material resulted in the adoption of the bearing-value and swell tests. These two tests were developed for the purpose of determining the two most important subgrade properties affecting pavement service, *i.e.*, the resistance to displacement under moist conditions, and the volume increase and uplift resulting from the absorption of moisture.

Production of granular-base materials by Consolidated Rock Products has been accomplished in several ways, the methods employed being fitted to the particular plant. In most cases, when granular materials are specified for base work, large tonnages and rapid deliveries are de-

manded. This has made necessary the stockpiling of large amounts and made possible the splitting of the plant flow to produce not only the base material but the normal requirements of commercial material.

Mr. Jumper outlined the original method developed by his company. Stockpile trucks are loaded with half crusher dust and half crushed gravel having a top size of 1 to 1½ inches. These loads are dumped at the site of the stockpiles and later piled by yard crane. The sizes become well combined by this method of handling. Samples for test purposes are taken at intervals.

Another method which has given excellent results is to take pit-run material, separating out the gravel above the specified top size and crushing it. The crusher is in closed circuit and the resulting material has been highly satisfactory.

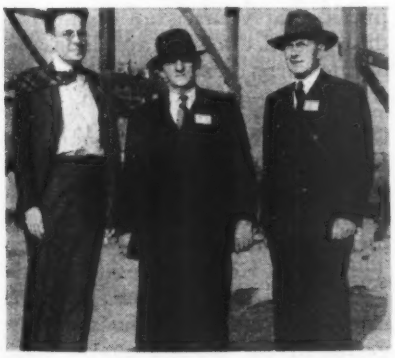
Still another method was described by Mr. Jumper which he said should appeal to those producers who have a constant demand for their crushed products, except for crusher dust. By this method, the pit-run is top-sized at a scalping screen, the oversize going to crushers and thence as a product separate from the gravel to a sizing screen or screens. All or a portion of the dust from the screens is returned to the already top-sized pit-run sand and gravel flow as base-material.

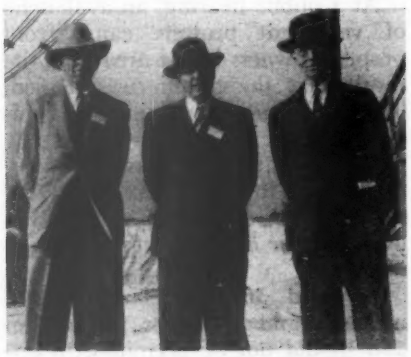
Tests prove, declared Mr. Jumper, that bearing value can be materially increased by the addition of small amounts of rock dust to pit-run sand and gravel. And, since the best values are obtained by good gradings, these can only be determined by experiment.

While the California bearing-value and swell tests are most favorable to granular materials without requiring clays and silts as a binder, this theory has not as yet generally been accepted in the country as a whole.

"We have two lines of thought in connection with sub-base material for use under pavement slabs," Mr. Jumper reported. "One believes that granular materials free of silt and clay, which may become unstable when wet, are best. The other believes that bases containing certain amounts of clays or silts to act as a binder when compacted produce a base which is impervious to water and should, therefore, remain stable under wet conditions. Whichever may be right, we do know that granular bases as discussed here have given excellent results where, under comparable conditions, bases containing moderate amounts of clay have failed."

At the conclusion of his paper, Mr. Jumper warned against any belief that granular-base materials can be successfully produced by the indiscriminate use of any waste materials which may happen to be handy. If the industry is to profit from the use of its products for granular-base work, it must produce that product by careful and painstaking methods.





Bituminous Mixtures Ezra C. Knowlton, vice-president of the Utah Sand & Gravel Co., Salt Lake City, presented a paper entitled *Practices of Western States in Using Sand and Gravel in Bituminous Mixtures.*

The studies covered the eleven western states and Texas, where the wide open spaces and sparse population have made all-weather roads a necessity and low cost of construction and maintenance imperative. In order to qualify many of the local aggregates some of the rigid requirements previously thought indispensable had to be waived; among these is the provision requiring a definite percentage of crushed particles in the finished product. Mileage statistics indicate that approximately 80 percent of the total of 64,788 miles of bituminous pavement of all types in the 12 states were constructed under specifications which were flexible, which did not require definite amounts of crushed material or required no crushed material at all. Results have been gratifying, Mr. Knowlton reports, and the highway industry has given the west much credit for its development of satisfactory, inexpensive bituminous road types.

In an endeavor to obtain present practices of the west in the use of gravel in these mixtures, Mr. Knowlton distributed a questionnaire covering the six standard bituminous pavement types covering present specifications and grading requirements.

Of the six types, the low-cost bituminous road produced by either

• Above, left: Chas. A. Horsky, counsel for the National Sand and Gravel Association and the National Ready Mixed Concrete Association; A. R. Ebersol, Barber Greene Co., Aurora, Ill.; Earl D. Stearns, Barber Greene.

• Above, right: M. Eugene Sundt, Albuquerque Gravel Products Co., Albuquerque, N. M.; Ronald C. Griffin, Consolidated Rock Products Co., Los Angeles; Jess Richards, Link Belt Co., Philadelphia.

• Right: M. A. Craven, Certified Concrete, Ltd., New Zealand; Otto S. Conrades, St. Louis Material & Supply Co., St. Louis, Mo.; L. V. Eversman, Missouri-Illinois Material Co., St. Louis, Mo.; N. J. Eschenberg, Construction Materials Co., St. Louis, Mo.; Stanton Walker, National Sand and Gravel Assn. and National Ready Mixed Concrete Assn.

the road-mix or the plant-mix method was favored four to one over the other five types in the mountain states. In these states the prevalence of alluvial gravels (provided by nature with acceptable mineral binders) has formed the basis of the so-called dense-graded bituminous mixtures which make up the road-mix and plant-mix types. A wide variety of acceptable mixtures have proved satisfactory, making it possible to use most of the available deposits so long as they contain structurally sound material.

Results of Mr. Knowlton's survey indicated that, as a general rule 1-in. maximum size is specified in the mixtures. For the average pit, processing of the entire product results in a substantial amount of crushed particles in the aggregate; however, none of the western states use any requirement for crushed particles with this type. Specifications were usually worded so broadly that the amount of waste in plant processing is at the minimum. Screen grading varied widely for each state.

The essential difference between the mixtures employed for low-cost western-type bituminous roads, and the standard asphaltic concrete type, is the use of smaller amounts of refined asphaltic binder and the liberality of the aggregate requirements. The result, said Mr. Knowlton, is a satisfactory road surface constructed at but a fraction of the cost of asphaltic concrete. The thickness of the bituminous layer varies from 1 to 3 inches depending upon base and drainage conditions.

"The greatest enemy," Mr. Knowlton said, "of this close-graded highway surface is water, and its great success has resulted from its being used in areas of relatively light rainfall and over terrain where drainage is good and foundation soils satisfactory. Across sections of bad soils or bad drainage conditions its success, as with any other non-rigid type of surface, depends upon a very substantial granular subgrade."

Zoning Laws The importance of zoning laws to the sand and gravel industry was brought home by one of the convention speakers, Clyde P. Harrell, Los Angeles attorney, who cited the difficulties encountered by one producer, John P. Gregg.

Mr. Gregg is a nationally-recognized expert on plant design and operation and is one of the important southern California operators in point of plant output as well. His plant, located in the Roscoe area in the San Fernando Valley, has a monthly capacity of 110,000 tons and has gradually depleted its deposit. Last year the Los Angeles zoning commission adopted a new ordinance relative to the use of land in that area, which was becoming

• J. H. Williams, The Conveyor Co., Los Angeles, does his own conveying in the chow line at the Graham plant.

highly residential due to the growth and expansion of the city of Los Angeles. About the same time Mr. Gregg, finding himself with only about 4 acres of his original deposit left, made plans to work an adjoining tract of about 100 acres which he owned or controlled in its entirety. He found it necessary to file an application for a permit to use this land for the production of aggregates.

At a public hearing, an avalanche of vehement protests came from property owners in the area with the result that the permit was denied. The objectors complained in this vein:

1. The sand and gravel industry is engaged in a business which destroys lands, removes its wealth, and leaves a scar on the earth to remain forever.

2. Sand and gravel pits are a nuisance and a danger to children and should not be permitted to operate in a residential area.

3. Noise and operation of gravel pits and plants interferes with the quiet enjoyment to which a residential property owner is entitled.

4. The mere existence of an excavation in the vicinity depreciates property values.

5. Truck traffic incident to gravel plant operations creates a traffic hazard, aggravated also by spilling of material on adjacent streets.

Other producers in the Los Angeles area, alarmed at the turn of events, joined with Mr. Gregg in the battle. Following the procedure described in the ordinance, Mr. Gregg appealed to the Los Angeles City council and, in asking that the denial be overruled, he agreed to do the following if the permit were granted him:

1. To cause the entire property involved to be completely enclosed with a high, mesh-type wire fence.

2. To conduct all operations with electric power.

3. To progressively "screen plant" the area with trees and shrubs, shielding it from public view as excavation proceeded.

The council finally granted the permit and incorporated in it as conditions the terms as above outlined.

"Now, it goes without saying," said Mr. Harrell, "that the rock industry has been negligent in its duty insofar as public relations are concerned. There has been no effort in this area on the part of that industry to eliminate objections to that industry on the part of the public. They seem willing to stand by and do nothing to educate the public as to the important place their industry has in the needs of the public." To the average person, the industry creates waste and contributes nothing to the welfare of the community, which is, of course, untrue.

"Fortunately we have discovered the situation and have time to act," Mr. Harrell said. "I hope our experience will prove of some benefit to you and that you will undertake a local, state, or industry-wide public-relations program to educate the public that yours is an essential industry, and that you are doing your best to carry on your operations with the public welfare in mind."

Construction in 1947 What about construction in 1947? The answers, in the opinion of one of the nation's leading authorities, were provided by Thomas S. Holden, president of the F. W. Dodge Corp. Mr. Holden is a familiar figure on convention programs in the pit-and-quarry industries and his predictions in past years have always coincided closely with actual figures after the totals are compiled.

Major questions for 1947, said Mr. Holden, are:

Can industrial labor relations be stabilized without serious strikes and work stoppages?

Can commodity prices be stabilized without a sizeable business recession?

Mr. Holden answered both questions in the affirmative, saw nearly all building materials in ample supply by the middle of the year and interpreted the decline in contract awards in the past several months as a market adjustment which would

reverse itself in most classes this spring.

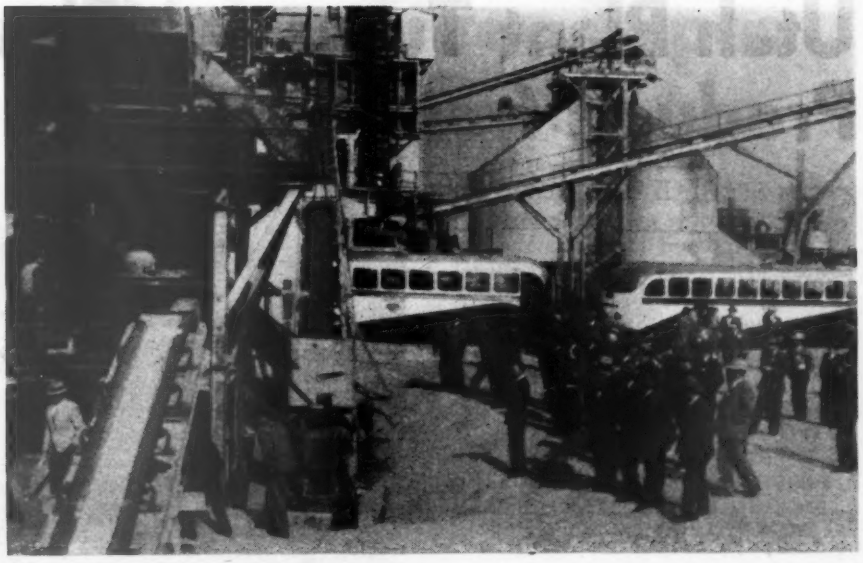
"The January upturn in construction contracts came as a surprise to me," said the speaker. "In view of

• Producers visiting the plant of the Azusa Rock and Sand Co., Azusa, Calif, inspecting the primary crusher.

the confusions of the market I had been expecting it about March. The upturn actually came in the last nine days of the month, total figures for the first three weeks having run about the same as in the corresponding period of December. It is not yet certain whether the January upturn was the beginning of a sustained rise in construction. Contract volume in the first half of February was running some 16 percent behind the first half of January on the basis of daily averages. This may be a brief seasonal setback, or it may mean that the January upturn was a bit premature. We will know when we get figures for the entire month of February.

"For residential building we have estimated for this year a 35 percent increase over 1946 in new dwelling units and a somewhat larger dollar volume increase. Apartment building should increase relatively more than one- or two-family houses. The bottleneck to apartment building is the same one that has existed since V-J day . . . refusal of the government to exempt new rental housing from rent ceilings. This, and all other controls, should be abandoned at once. Controls are not effective, serve no useful purpose, have only nuisance value."

With regard to public building and engineering work, Mr. Holden sees three limiting considerations: (1) high costs; (2) budget limitations of government at all levels; and (3) competition for materials



• Visiting producers were carried in buses to the Graham Bros. plant at El Monte, Calif.

and manpower with urgent private work.

"There are many public projects of great urgency, since many new private developments cannot function properly without adequate community facilities. We estimate for this year a 48 percent increase over 1946 in the dollar volume of public and institutional buildings and a 22 percent increase in heavy-engineering construction."

The 1947 estimates of the Dodge organization are for a 10 percent increase in commercial building and a 14 percent decrease in manufacturing building.

Housing Report Some of the difficulties in producing housing on a mass scale in California were recounted by Fritz B. Burns, president of Kaiser Community Homes, a Henry J. Kaiser project which has received considerable publicity in the nation's press.

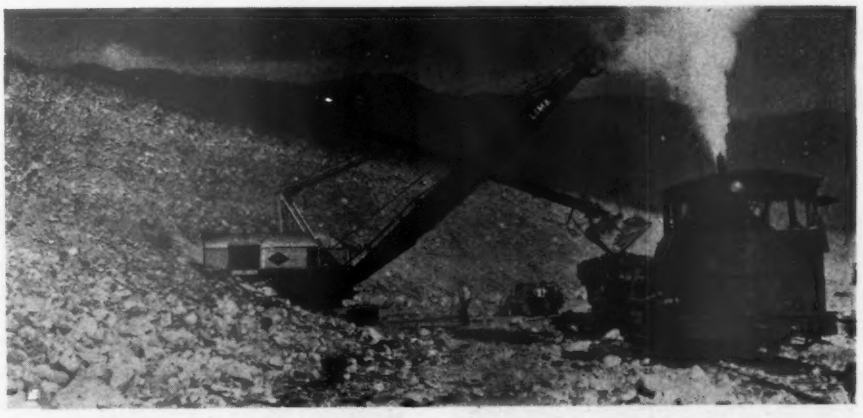
The national program under the Wyatt regime was said to have failed because too many houses were started which had no chance of being completed due to inability to obtain materials. Mr. Burns described the red tape and some of the humorous incidents involved in attempting to obtain scarce materials declared surplus by the government.

The demand for housing continues great and will continue, but he sees danger to builders ahead if the trend toward ever-higher prices continues. In his opinion, the goal of 1,000,000 new homes started and completed in the year 1947 will be achieved.

Cement Plants in Britain Hard Hit by Power Shut-Down

The cement industry in Great Britain was an early casualty in the recent government-enforced reduction of electrical consumption. Plants throughout England and Wales forced to close down when unprecedented cold weather and storms hampered coal transportation. The coal-depleted power companies were forced to allocate their reduced electrical output to essential industries and public utilities.

Resumption of full scale operations of cement manufacturers will undoubtedly be slowed down long after the present power crisis is over, due to the critical shortage of raw materials.



• At the sand and gravel pit of the Consolidated Rock Products Company near Azusa, Calif., a Lima Type 1201 shovel is being used with good results for excavating.

Utah Plant Turns out Five Special Products from Limestone and Marble

another ON THE SPOT report

SPECIAL stone products in the form of marble terrazzo chips and limestone poultry grits are being produced this year in a new plant at Salt Lake City owned and operated by the Utco Products Company, a subsidiary of the Utah Lime & Stone Company, well-known lime and limestone concern.

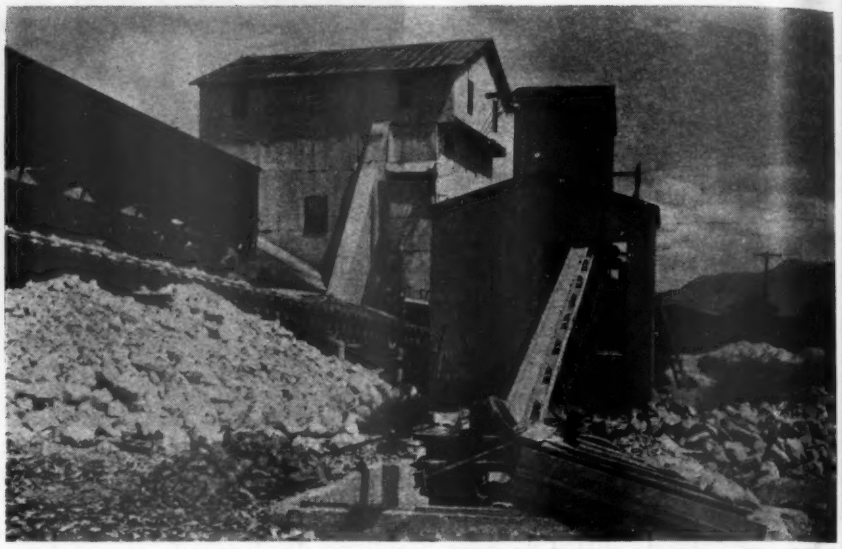
The plant started operations in March, 1946, and all the product

By HARRY F. UTLEY

is packed in 100-lb. paper bags with shipments being made as far east as Denver and to various Pacific Coast points. Some of the fine minus-16-mesh product is mixed with other minerals as a poultry- and stock-feeding supplement and is packed at the Salt Lake plant under the label of the Marblehead Lime Company of Chicago to supply the latter's western outlets.

The quarry-size stone is shipped by railroad and truck from various points in Utah, the marble being largely selected for its color value—pure white, jet black, pink and buff hues predominating. The limestone is high-calcium rock.

At the plant all the stone is first broken down by a 10- by 20-inch Ajax-Marathon jaw crusher, then taken by an 18-inch by 60-foot inclined belt conveyor to the main crushing building. Here the stone may be diverted to either a 6- by 18-inch Universal jaw crusher set at ¾ inch, or to a Gruendler 2XB hammermill, or both, for final reduction. The Universal machine is used primarily when granite is being processed while the Gruendler mill's principal function is to produce cubical poultry-grit particles and limestone fines.



• The Utco Products Company's plant at Salt Lake City, showing the crushing and mill buildings. The car at the left has just discharged a load of stone.

The five grades of finished stone and the general uses for which each is sold are as follows:

½- to ⅜-inch—Turkey grits; No. 2 terrazzo chips.

⅜- to ¼-inch—Hen grits; No. 1 terrazzo chips.

¼- to ⅛-inch—Intermediate poultry grit; No. 0 terrazzo chips.

⅛- to 1/16-inch—Chick grits; "sanding" material for icy pavements.

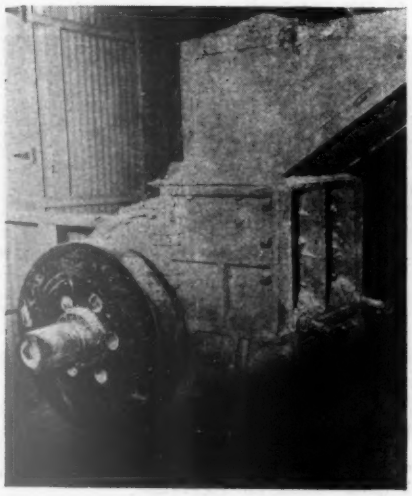
1/16-inch to dust—Filler for commercial fertilizer; ingredient of stock and poultry mineral feed.

The crushed and ground stone is then raised by a 20-foot bucket elevator to a Simplicity single-deck vibrating screen equipped with ⅝-inch wire cloth located directly above the two reduction machines and in closed circuit with them. The oversize is returned for recrushing and the throughs are discharged to a surge bin which feeds, via a short belt conveyor, a 30-inch by 16-foot rotary drier. The drier was built by the company and is oil-fired by a Denver Fire Clay burner.

From the drier, the stone is raised 70 feet by another belt-bucket elevator to the main plant building, where a pair of Simplicity double-deck screens size the five products which are chuted to a like number of steel bins. These bins, each having a capacity of about 5 tons, feed the bag-packing spouts. Each prod-

(Continued on page 70)

• Left: The hammer mill which produces the limestone fines and poultry grits.
• Below: One of the three vibrating screens. This is a single-deck unit in closed circuit with the jaw crusher and hammer-mill.
• Right: The one-spout valve packer, used for the finest product.



California Firm Makes Three Types Of Products in Combination Setup

another ON THE SPOT report

SAND and gravel, ready-mixed concrete, and concrete blocks are being produced in a combination plant which went into operation in the summer of 1946 at Redding, Calif. Known as the Oaks Sand & Gravel Co., the plant was

By HARRY F. UTLEY

erected on a deposit owned by Grover E. Oaks, Redding financier and mining operator, and located on Clear Creek near its confluence with the Sacramento River.

The aggregates plant has a capacity of about 100 tons per hour, a considerable portion of which is being utilized by the company in the form of ready-mixed concrete and concrete building units. The same bins and weigh-batcher which serve the truck-mixers are used to weigh out aggregates into trucks, thus eliminating the need for a separate truck scale and scale operator. The same set-up will likewise feed the mixer at the block machine. In order to get into block production quickly, however, the new tamper was installed separately on a temporary location near the plant. Sacked cement is being used at present but a bulk-cement plant is shortly to be erected alongside the batching bins.

The plant hopper is presently being kept filled by a Caterpillar tractor-drawn Carryall 6-cubic yard scraper. This method of excavating is later on to be replaced by a cableway-and-bucket system. A Bodinson reciprocating feeder puts the material on the 24-inch by 180-foot plant conveyor which carries the pit-run material up to the top of the plant. A triple-deck vibrating screen built by the company carries 2½-, 1½-, and 1-inch mesh cloth, the throughs passing to a Pioneer 3-deck screen with ¾-, ⅜-, ¼,- and ⅛-inch wire cloth, the bottom deck being divided to pass both concrete and plaster sand. Both screens are equipped with sprays to wash the material, water being pumped from the creek by a Byron-Jackson pump. The two sands are scrubbed by a pair of Bodinson 12-inch by 12-foot screw washers. The sized and washed gravel and sand are dropped into storage on the ground below, timber bulkheads keeping the sizes separated. The largest material — plus 2½ inches—may be crushed later but at present the plant is not equipped with a reduction machine.

The aggregates are reclaimed from ground storage by a 24-inch by 200-foot belt conveyor which operates in a 7-foot-diameter corrugated-metal culvert pipe which forms the reclaiming tunnel beneath the piles. Manually-operated gates feed this belt which runs up to the top of the Madsen Iron Works batching plant. At some future date Mr. Oaks hopes to install electric feeders or remote-controlled gates in the tunnel so that the operator on the batching floor can control the flow of aggregates into the batching bins.

The bins have a capacity of 100 tons of material and are divided into four compartments. A Madsen weigh batcher and scales complete the installation. When the Blaw-Knox bulk-cement plant is installed,

• A general view of the Oaks Sand & Gravel Company's washing-and-screening plant for aggregates, located at Redding, Calif., on Clear Creek near its confluence with the Sacramento River.

• Left: The feeder beneath the receiving hopper places pit-run material on the main belt conveyor.

• Right: The two screw washers which scrub the concrete sand and plaster sand.

it will receive cement from bulk-cement trucks.

Concrete blocks are being molded on a Miles tamper. Temporarily, a small batch-type mixer is supplying the concrete but this will be replaced by a larger unit when the concrete-block plant is tied in with the batching plant.

Two truck-mixers — a 2-cu. yd. Smithmobile and a 3-cu. yd. Jaeger —form the nucleus of what Mr. Oaks expects will grow into a sizeable fleet for mixing and delivering the concrete.

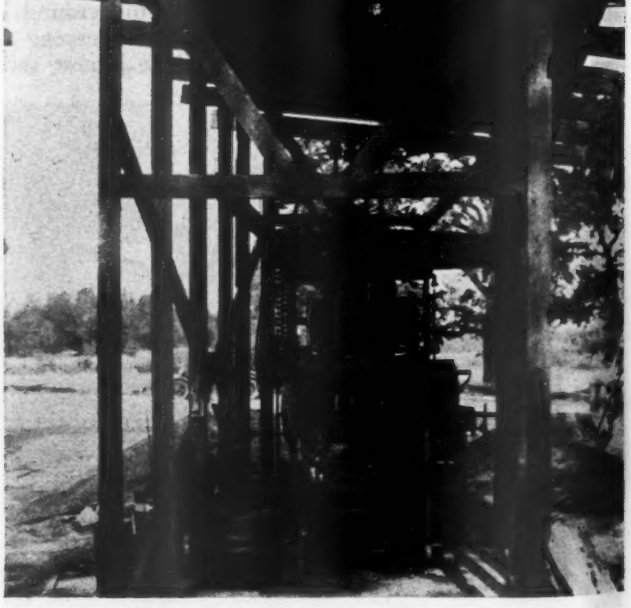
Engineers of the Bodinson Manufacturing Co. of San Francisco assisted Mr. Oaks in the design and erection of the plant. Rex idlers and Goodall belting were used to fabricate the conveyors.

Edward Oaks, son of the owner, is manager of the operation.

• Below: The throughs from the first triple-deck vibrating screen pass to a second (here pictured) with ¾-, ⅜-, x ¼-, and ⅛-inch cloth and a bottom deck divided to pass both concrete and plaster sand.

• Bottom, left: The truck-loading bin and batching plant. Here a dump truck is being loaded with gravel, weighed out on the same scales used to batch concrete ingredients into the truck-mixers—an arrangement which eliminates the need for a separate truck scale and scale operator.

• Bottom, right: The power-operated tamp-type block machine, recently installed in a temporary location, is fed by a batch-type mixer, which later will be replaced by a larger unit when the block plant has been wholly consolidated with the batching plant.



Utah Plant's Five Products

(*From page* 68)

uct is hand-weighed into sacks with the exception of the finest, which is automatically weighed into valve bags by a single-spout St. Regis packer.

H. H. Ellerbeck is general manager of the Utco Products Company. The parent concern, Utah Lime & Stone Company, of which T. R. Ellerbeck is the head, operates a lime and limestone plant at Dolomite, in Tooele County, and also manufactures the patented Ellernan calciner for lime. The lime plant is presently being enlarged by the addition of another Ellernan calciner. This unit is a modified version of the vertical lime kiln but has the advantage, among others, of allowing the utilization of small-size stone in the feed.

U. S. Talc Production Lower Than 1943 Wartime Total

Mined production of talc, pyrophyllite and ground soapstone continued to decline from the high levels of 1943, according to reports from producers to the U. S. Bureau of Mines. Sales increased slightly in quantity, but declined in value. Sales of ground materials were larger in both quantity and value in 1945 than in 1944. Sales of crude products were lower in both catagories. Total imports in 1945 of all classes of these materials were less in both quantity and value than in 1944, as were also imports. Exports of "talc, steatite, soapstone and pyrophyllite, crude and ground" increased in 1945 both in quantity and in value.

Maine Operator Installs Laboratory For Control of Materials Production

another P-Q exclusive

IN 1943 when W. H. Hinman, Inc., was engaged in a large number of war contracts, it was decided that laboratory control was necessary for the manufacture of crushed stone and bituminous concrete mixtures. A small laboratory was therefore provided in a corner of a storehouse at a quarry operated by the firm. Although very poorly equipped, this testing room served a very important purpose. Often before reports could be obtained from the overworked commercial laboratories, complete material problems for contracts were solved at the plant.

By **CHARLES F. PARKER**
Chief Engineer
W. H. Hinman, Inc., North Anson, Me.

• A section of the Hinman laboratory, showing the apparatus for testing bituminous materials.

Among the projects served by this plant laboratory was the construction of pavements at the New England Ship Building Yard and construction of pavements at the Brunswick air base, besides various other army and navy contracts.

The necessity and value of a laboratory to a contractor in the systematic handling of materials and construction procedure having been established, it was decided to construct and equip a modern materials laboratory that would be second to none operated by a Maine contractor. After much consideration it was decided that the facilities should be completely equipped for the routine tests for all grades of penetration asphalt, cut back asphalt, emulsified asphalt, creosote, tar and mineral aggregates, provision being made for expansion to include cement and cement concrete. The apparatus provided also for many soil tests and foundation studies.

One of the definite assignments was the control of the manufacture of crushed stone at the Blue Rock Quarry, a subsidiary of W. H. Hinman, Inc. This task alone continued to grow and now is a routine procedure. The forms used at Blue Rock Quarry are shown in Form A, Form B and Form C. Another assignment was the design and control of bituminous concrete mixtures from plants operated by W. H. Hinman, Inc. In order to select materials at the most economical haul, it is necessary to make many tests, and such a procedure would not be feasible if samples had to be sent to a commercial testing laboratory.

Another function of the laboratory is to serve in making a materials survey. Such testing not only proves valuable in estimating costs and bidding data, but often expedites the location of crushing plants and asphalt plants after a contract has been awarded. We have found that such data is very important to the contractor and also to the buyer. Even when making these surveys after a contract has been awarded is a very direct savings, it gives greater flexibility and as a general rule many more sources are tested than when samples are sent to a commercial laboratory by the buyer instead of the contractor.

Supplying advice to the public on the proper use of materials is another important function of our lab-

• Left: The Blue Rock quarry crushing plant of W. H. Hinman, Inc., North Anson, Me., where production is controlled by the laboratory.

• Right: The Hinman asphalt plant, which makes bituminous mixtures designed and controlled by the contractors' laboratory.

oratory. We have also been of service to various agencies in the preparation of specifications. Often a simple laboratory demonstration enables us to show our customers the importance of proper construction methods. We believe that technical

• P. V. Corey, vice-president of W. H. Hinman, Inc., and C. F. Parker, chief engineer.

data coming from laboratories such as ours should provide a source of information valuable to those responsible for the preparation of materials specifications.

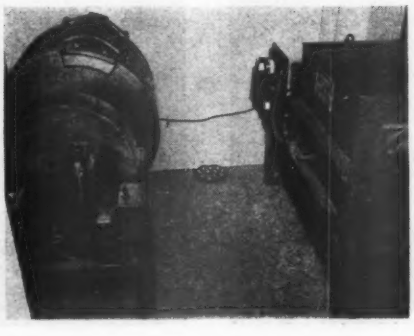
Training personnel employed by the contractor has also been an important duty of our laboratory staff. During the winter months, when construction work is more or less at a standstill, an excellent opportunity is provided to train our key men in the proper use and selection of materials. This has proved a decided advantage; and our superintendents are now familiar with the significance and application of many of the routine tests. Take for example cement concrete mixtures. Many of our own men knew that water was a necessity to obtain workability, but they had very little conception of the amount of water carried by aggregates, the bulking of sand and other such fundamentals. After training in the laboratory these men are able to design ordinary cement concrete mixtures and compute the various factors. This has not only increased their interest in materials, but has resulted in better concrete and better construction. One interesting development is that these men can estimate within a few points how rock will test on the Los Angeles Method. Our asphalt plant operators now realize the importance of temperature control and proper mixing, as well as the proportioning of the mixtures.

Another purpose of this laboratory is research, not only for the improvement of production and the uses of the materials, but also to develop new products and new uses and in general to broaden the field covered by our production. One of the results of this research was the development of a treatment for aggregate to increase its affinity for asphalt. This process now has a patent pending and is expected soon to be placed on the market. (We anticipate that this new method will be of most value in surface treatments, but it is also adapted to the manufacture of cold-mix bituminous concrete.)

One of the problems studied by our laboratory staff was the adhesion of bituminous material to mineral aggregate. This problem was a very realistic one, as it was causing us trouble with our bituminous mixtures, especially in the manufacture of cold-mix bituminous concrete. It was found that aggregates passing standard adhesion tests often stripped badly when manufactured at our plant. Hence, the first step was to develop a laboratory test that would consistently check with what we could expect in the field.

We tried many tests which seemed to be practical in the laboratory, but which were a failure in checking field results. After many trials we did develop a test that we have now used for over two years, and it has never failed to show what might be expected in the field. The test is made in the following manner. The mineral aggregate used is from our quarry and is known as micaceous quartzite or trap rock. The important thing is the gradation of the mineral aggregate, which is according to Fullers Curve for a maximum size of ⅜-inch and 100 percent retention on the 100-mesh sieve. The purpose of this gradation is to represent an average field mixture and to remove the possibility of having any colloidal sizes in the mixture. It is well established that colloidal sizes

• The machine used for the wear test of rock (left) and the laboratory hot mix plant (right) used in designing bituminous concrete mixtures.



assist in obtaining adhesion, and it is rarely known in the field what percent if any of this colloidal material there is in the aggregates being used. As the 100-mesh sieve equals 149 microns, and as colloidal sizes are less than one micron, we believe that washing the aggregate through a 100-mesh sieve removes all of the colloidal material. The bituminous material used for this test is, of course, the same as is to be used in the field mixture. Regardless of the type of bituminous material, the same procedure is followed. The tests are run at three different temperatures, the highest and the lowest recommended by the manufacturer and an average of these two temperatures. If different temperatures are to be used in the field, tests are also made at the range of temperatures to be used in the field. A complete test is made at each of the three temperatures for dry aggregate and then with the following percentages of moisture: 2 percent, 4 percent, 6 percent, 8 percent and 10 percent. When all tests pass, we believe that the bituminous material is satisfactory for all conditions that will be encountered in the field. When there is any visual stripping, we recommend the use of the material one step below the point at which stripping occurred. For example, if there is visual stripping at 6 percent moisture, we would recommend the use of the material only when the moisture of the mineral aggregate is less than 4 percent.

Stripping is checked in the following manner. Approximately 50 grams of the fresh mixture is placed in an ordinary pint jar and the jar is then filled two-thirds full of distilled water at 77 deg. F. The jar is then shaken vigorously for two minutes. A drop of the mixture is then placed on a piece of filter paper and examined for any uncoated aggregate. The percentage of stripping is merely a visual estimate.

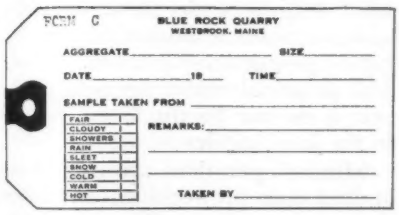
Ordinarily a 500-gram sample is used in performing this test. The percentage of bituminous material is arrived at by computing the surface area of the aggregate and applying the Edwards formula for the amount of bituminous material required for that particular surface area. Although this test may sound complicated, it really is a simple test and requires a small amount of time. As it is a qualitative and not a quantitative test, accurate measurements are not necessary. This does not mean that the test can be carelessly performed.

Realizing the importance of additives, we decided to make a study of

all the known additives and finally selected eight from various manufacturers. We have to date made over 100 tests on these additives. Many interesting results were obtained in this experiment, and the author intends to prepare an article at a later date dealing entirely with this particular research problem. However, we do wish to state that additives are of value, but that there are other factors which control adhesion within certain limitations, such as gradation, proper temperature control and control or elimination of free moisture in the mineral aggregate.

Finally, we believe that laboratory control by the producers is a very sound and progressive principle. With the increasingly severe requirements of modern specifications, it is becoming almost a necessity. Furthermore, if the manufacturer uses such control, we believe that a large amount of the data obtained should be made available to those responsible in the preparation of specifications. Such a practice should result in better specifications and superior construction.

• Form C, the tag used in marking aggregates delivered at the laboratory for testing.


FORM C

BLUE ROCK QUARRY
WESTBROOK, MAINE

AGGREGATE _____ SIZE _____

DATE _____ 19__ TIME _____

SAMPLE TAKEN FROM _____

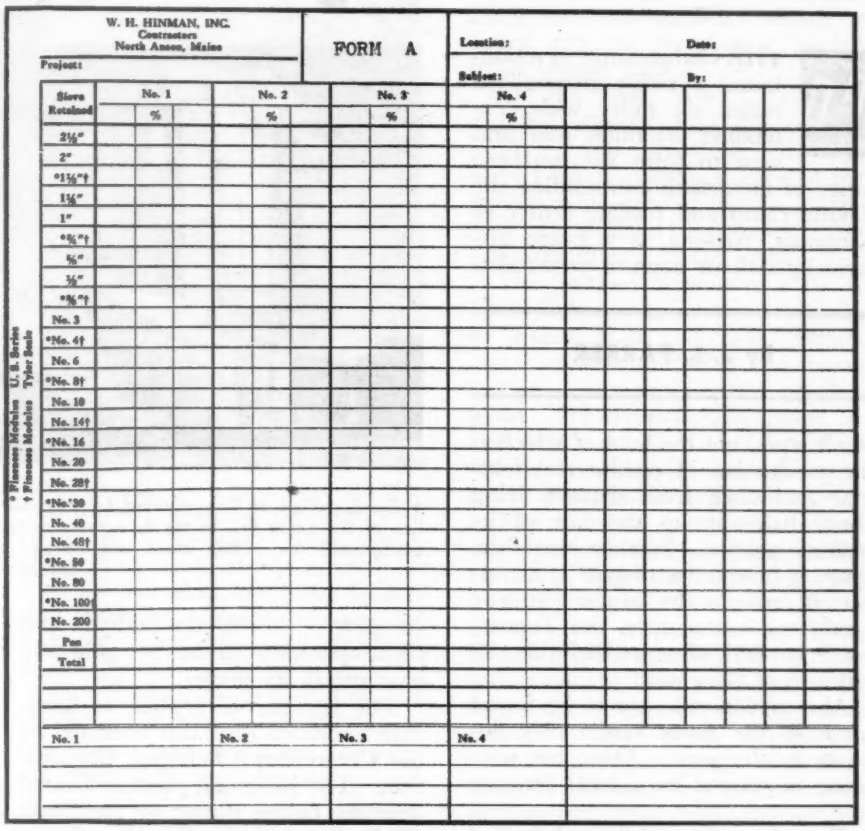
FAIR	
CLOUDY	
SHOWERS	
RAIN	
SLEET	
SNOW	
COLD	
WARM	
HOT	

REMARKS: _____

TAKEN BY _____

• Form A, the form used for recording mechanical analysis made in the laboratory.

• Form B, the form used by the laboratory staff for controlling production at the Blue Rock quarry plant.


W. H. HINMAN, INC.
Contractors
North Anson, Maine

FORM A

Project: Location: Date:

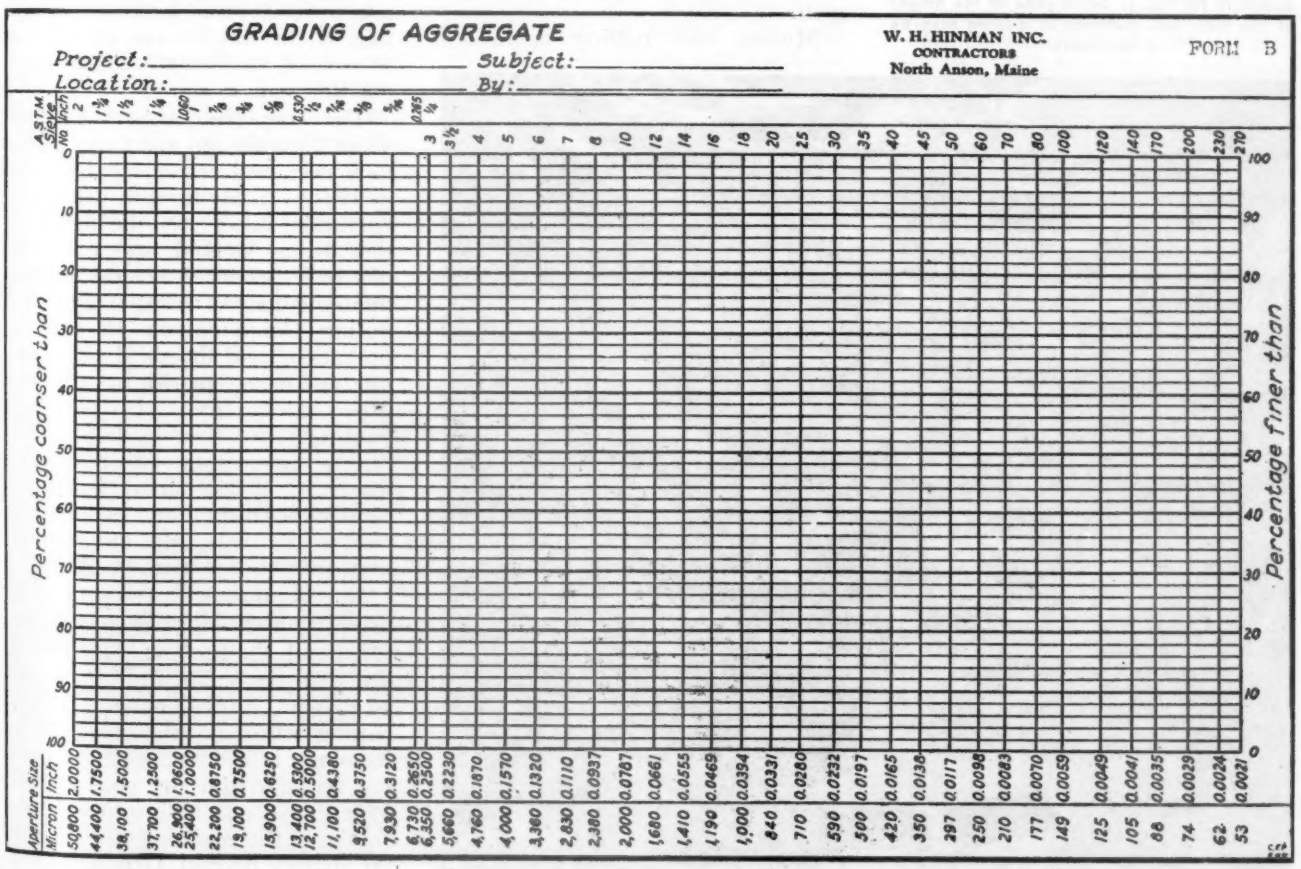
Subject: By:

Sieve Retained	No. 1 %	No. 2 %	No. 3 %	No. 4 %
2½"				
2"				
°1½"†				
1¼"				
1"				
°¾"†				
⅝"				
½"				
°⅜"†				
No. 3				
°No. 4†				
No. 6				
°No. 8†				
No. 10				
No. 14†				
°No. 16				
No. 20				
No. 28†				
°No. 30				
No. 40				
No. 48†				
°No. 50				
No. 80				
°No. 100†				
No. 200				
Pan				
Total				

U. S. Series Tyler Scale

° Pioneer Machine
† Pioneer Modernized

No. 1	No. 2	No. 3	No. 4


GRADING OF AGGREGATE

Project: _____ Subject: _____

Location: _____ By: _____

W. H. HINMAN INC.
CONTRACTORS
North Anson, Maine

FORM B

ASTM Sieve No. / Inch: 0 / 2 / 1½ / 1¼ / 1 / 1000 / ¾ / ⅝ / ½ / ⅜ / 0.530 / ½ / ⅜ / 5/16 / 0.265 / ¼ / 3 / 3½ / 4 / 5 / 6 / 7 / 8 / 10 / 12 / 14 / 16 / 18 / 20 / 25 / 30 / 35 / 40 / 45 / 50 / 60 / 70 / 80 / 100 / 120 / 140 / 170 / 200 / 230 / 270

Percentage coarser than: 0 10 20 30 40 50 60 70 80 90 100

Percentage finer than: 100 90 80 70 60 50 40 30 20 10 0

Aperture Size Micron / Inch:
50,800 2.0000 / 44,400 1.7500 / 38,100 1.5000 / 31,700 1.2500 / 26,900 1.0600 / 25,400 1.0000 / 22,200 0.8750 / 19,100 0.7500 / 15,900 0.6250 / 13,400 0.5300 / 12,700 0.5000 / 11,100 0.4380 / 9,520 0.3750 / 7,930 0.3120 / 6,730 0.2650 / 6,350 0.2500 / 5,660 0.2230 / 4,760 0.1870 / 4,000 0.1570 / 3,360 0.1320 / 2,830 0.1110 / 2,380 0.0937 / 2,000 0.0787 / 1,680 0.0661 / 1,410 0.0555 / 1,190 0.0469 / 1,000 0.0394 / 840 0.0331 / 710 0.0280 / 590 0.0232 / 500 0.0197 / 420 0.0165 / 350 0.0138 / 297 0.0117 / 250 0.0098 / 210 0.0083 / 177 0.0070 / 149 0.0059 / 125 0.0049 / 105 0.0041 / 88 0.0035 / 74 0.0029 / 62 0.0024 / 53 0.0021

Feldspar-Silica Operations at Arizona Plant Continuing Full Production

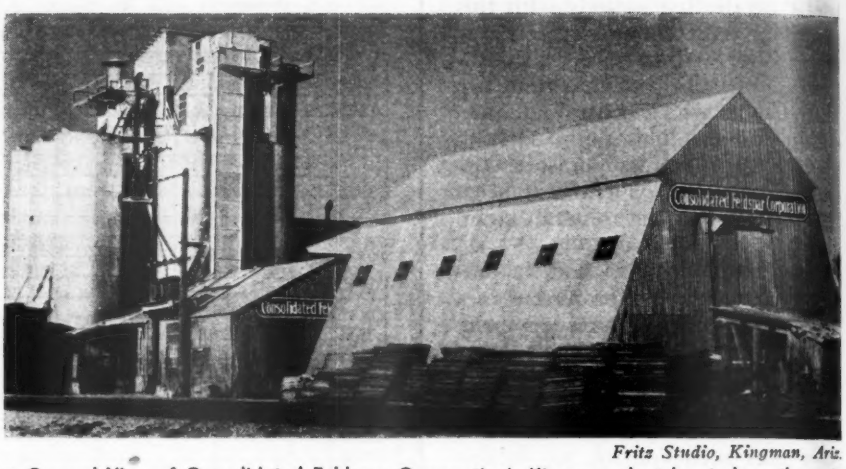
another P AND Q exclusive

THE Cerbat range of mountains, a richly mineralized range six miles wide, extending 20 miles east and west to form the northern range of mountains surrounding the mining camp and trading center of Kingman, Arizona, is a range historically rich in mineral production

By J. L. PARKER

of all types, not the least of which is the production of commercial feldspar and silica from deposits lying about half-way up the side of its eastern portion. Farther west the range is productive of gold and copper; it contains the largest lead-zinc producers in the state, the Tennessee Schuylkill Mine at Chloride, 20 miles from Kingman.

Also at Chloride are to be found some of the finest kaolin clay deposits in the west. These are now being developed by a local ceramic company. East of the feldspar and silica operation are further gold and base metal ore bodies.



Fritz Studio, Kingman, Ariz.

• General View of Consolidated Feldspar Corporation's Kingman plant located on the main line of the Santa Fe. In the foreground may be seen the 800 ton crude ore storage, in the background the milling plant and storage silos with loading operations underway in the boxcar at the left.

The feldspar-silica plant at Kingman is one of 12 plants operated by the Consolidated Feldspar Corporation. The Kingman plant is located near the Louise station on the Santa Fe Railroad, four miles from Kingman.

Mining and milling operations were at peak scale throughout the war and postwar demands insure capacity production for a long period. The principal outlet for both products is on the Pacific Coast, largely in the Los Angeles area.

Mining operations are carried on in three open pit workings seven miles distant from the mill at an elevation of 5,000 feet. Little or no snow falls in the district and mining can be carried on economically throughout the year.

The deposits were uncovered about 25 years ago and Consolidated took over and completed the plant in 1931. It has been in continuous operation since. Of the three pits now being worked, the two large pits have produced several hundred thousand tons of feldspar and silica during Consolidated's 15 years of operation; and the third pit, a new one just being opened, has the same expected capacity. All pits contain long-term ore reserves located favorably for continued economical mining. The company has developed sufficient real and potential ore reserves to make continuing operations possible for many years.

In common with most feldspar production the silica is closely identified with the feldspar. In this case the feldspar bodies are almost vertical, with vertical bands of quartz cutting through the feldspar or forming intruding walls between the feldspar and the country rock. Where the quartz intrudes in this manner, the walls of the deposits are sharply defined. Generally, how-

• The author points out the dark band of quartz in Pit No. 1. Some idea of the height of the face and methods of drilling may be had here.

Fritz Studio, Kingman, Ariz.

• The truck and buckets in action at the sorting pile in pit No. 2.

Fritz Studio, Kingman, Ariz.

ever, the limitations in the ore are not as sharply defined, and a certain amount of hand sorting is necessary in the pits.

In actual practice the pits have been mined as a single bench with comparatively narrow mouths opening into massive deposits 40 to 100 feet wide and to depths up to 200 feet at the points of deepest penetration. There is practically no overburden in any of the pits, and all ore mined is readily reclaimed to within a foot or so of the surface.

The rock is drilled at the face, usually on two or more levels and blasted to the floor of the pit, where it can be readily sorted. Mining over the years has averaged a ratio of feldspar to silica of approximately 9 to 1.

Hand sorting with open-tine forks is readily done in conjunction with the use of Dempster Dumpster equipment. The greater fragmentation of the country rock makes the sorting comparatively simple, the waste largely dropping through the fork tines. Normally the Dumpster equipped Chevrolet 2-ton truck drops three units at the work pile. Two of the units are hand loaded with feldspar. The third may be used either for silica or hand-sorted waste.

The Dempster unit is capable of handling the 50 tons per day average output from the pits. Normally not more than two pits are worked at one time. This makes possible drilling and development work in the remaining pit and enables the company to keep its sorting piles well ahead of its immediate needs and insures maximum production at all times.

The sorted ore is hauled to one of three loading tipples at the mouth of the pit. The tipples have a combined capacity of 100-tons storage for both silica and feldspar.

The ore is hauled to the mill from the mine ore bins in two 2-ton trucks, a new International and a White. A round trip on the 7-mile haul is made in one hour.

At the mill, ore is normally dumped directly into the primary crusher sump. However, the company keeps a reserve storage of 800 tons of mine ore under cover at the mill. In addition they stockpile considerable quartz in the open.

The primary crusher is a 10- by 18-in. Reliance jaw crusher reducing to minus ¾-in. A 3-ft. Symons cone crusher reducing to minus 3/16-in. completes the crushing plant. The Symons is in closed circuit with a double-deck Tyler Hummer screen which takes out glass spar and rejects oversize to the Symons.

The Symons furnishes the feed when needed for two fine-grinding Hardinge tube mills grinding with Danish pebbles. In this circuit, tramp iron is removed by Dings magnetic pulleys. The fine product is conveyed by bucket elevator to the upper floor, where it can be passed through a 12-ft. Gayco separator to produce any percentage of fineness desired. The same equipment is used in handling both feldspar and silica. Mesh ranges from 20 to 200 depending upon the orders at hand.

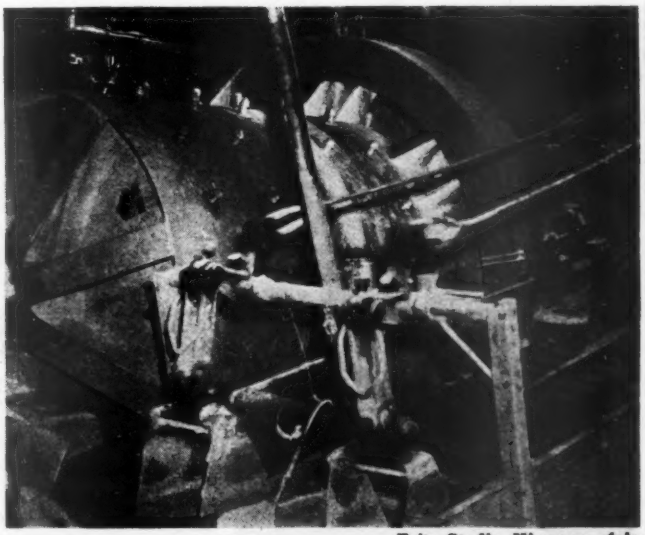
The three finished-product silos and the mill-floor bag warehouse have a storage capacity of approximately 550 tons of products in bulk and bags. The mill is equipped with a semi-automatic bag filler and bag-loading conveyor used in cars on the siding for odd-lot shipments. Feldspar and silica shipments are normally shipped loose in carload

(*Continued on page* 76)

• The specially equipped truck unloading into the crude bin at the mine. Ore from the bin is chuted to the mill haulage truck loading at the level below.

• A close-up view of one of the plant's two tube mills.

Fritz Studio, Kingman, Ariz.



Fritz Studio, Kingman, Ariz.

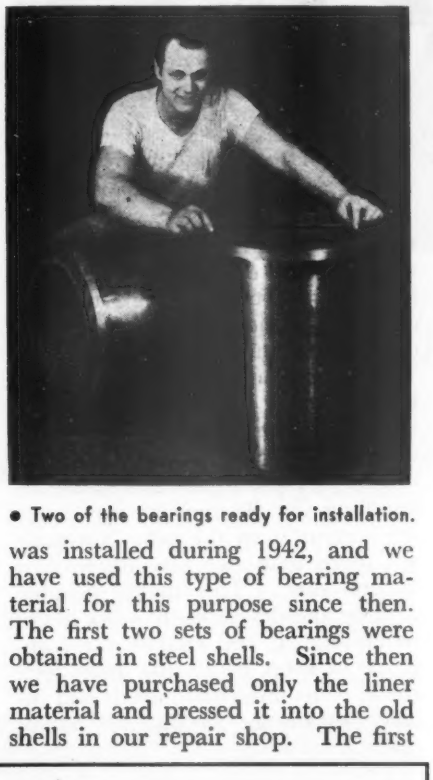
One-Piece Bearings Mounted in Steel Shells Solve Crusher Bearing Troubles

THE swinging jaw of the 60- by 48-in. crusher used at the Consolidated Quarries plant, Lithonia, Ga., came fitted with grey-iron half-shell bearings originally. After a few months' wear it was difficult to keep these halves tight in their seat in the frame of the crusher as a slight bouncing of the swinging jaw tended to loosen the bearing cap bolts. Grease grooves in the cast iron also tended to clog solidly in a short time, and the bearings caused excessive wear of the swinging jaw shaft. At one time we used electric welding to build up on the shaft and then turned it down to original size with a portable lathe. In this jaw crusher the shaft is pressed into the swinging jaw and replacement in the field is a very difficult problem. Movement of loose bearing shells in the frame of the crusher caused wear at this point, too.

By **NELSON SEVERINGHAUS**
Superintendent
Consolidated Quarries Corp., Lithonia, Ga.

In an attempt to overcome these troubles, we installed a set of Ryertex bearings mounted in solid steel shells. Favorable reports on this type of bearing material when used on roll-neck bearings in steel mills led to this trial. We did not think that our conditions could be any more severe than those on steel rolls, where heat and pressures are both extreme.

Our first set of Ryertex bearings



• Two of the bearings ready for installation.

was installed during 1942, and we have used this type of bearing material for this purpose since then. The first two sets of bearings were obtained in steel shells. Since then we have purchased only the liner material and pressed it into the old shells in our repair shop. The first installation had dowels to prevent liner material from turning in the steel shell. We later found that a good tight press fit would hold these without using dowels. Inside and outside diameters were held to the same as those of the original cast iron bearings, so that no modifications of the crusher were needed. Installation of replacements is made by removing the frame caps, lifting the swinging jaw high enough to clear thrust collars, then slipping the old bearing off the end of the shaft and the new one on.

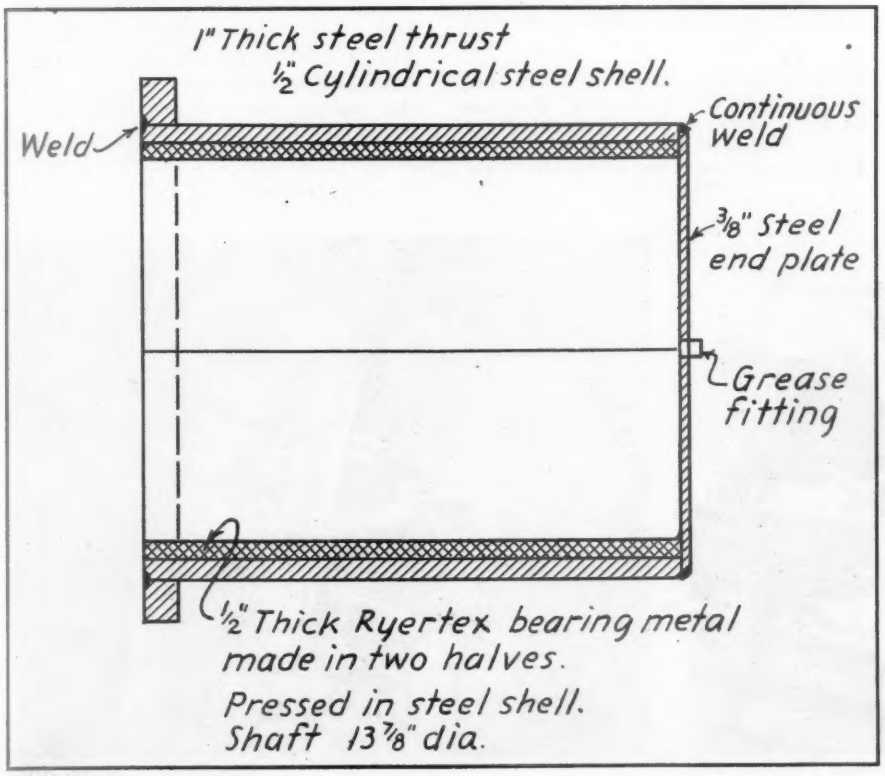
Advantages which have been reaped from this installation include:

(1) Longer life for the Ryertex bearings than for the former cast iron ones.

(2) Greatly decreased wear of the swinging jaw shaft. We have not replaced or dressed up a shaft since 1942. This was formerly required every two years or so.

(3) Less cost per hour run for the bearing materials.

(4) The "one-piece" Ryertex bearings are much easier to hold tight in the frame than the original half bearings. There is less danger of damage to the frame of the crusher by motion of the bearing shells.



• Sectional view showing how liner material is pressed into old shell.

Feldspar Silica

(*From page* 75)

lots. Cars are loaded by gravity directly from the storage silos.

The mine and plant normally employ 18 men.

L. D. Gregory, manager of the plant, came to Kingman from the Carolina Mineral Company, Bedford, Va., where he had been manager of that Consolidated subsidiary. Mr. Gregory has been with Consolidated Feldspar for the past 37 years.

The R. A. Craig Company of Lacon, Ill., has moved $150,000 worth of equipment to Olney, Ill., for the operation of a gravel and crushed stone business. About 75 percent of the stone will be processed as road stone, the remainder as agricultural limestone.

At the Caledonia plant of Gypsum, Lime & Alabastine, Canada, Ltd., of Toronto a $30,000 fire protection system will be installed in the immediate future.

THE USE OF THE DROP BALL TO REDUCE OVERSIZE STONE

By WILLIAM M. AVERY

ONE of the most significant and comparatively recent developments in quarry operation is the successful application of the drop ball to the problem of reducing oversize stone. Note, however, that the reference is to "successful application," for the principle of the drop ball was in all probability discovered not long after the species came down out of the trees. Breaking by the impact of a falling object was surely one of primitive man's earliest discoveries, and all things considered it still looks like a pretty good idea. The steel industry, for example, has for many years used a free falling ball (called a skullcracker) for breaking up scrap, and to this day no economical substitute method has been found.

Perhaps a score of years ago a few quarry operators toyed with the drop ball as a substitute for costly secondary shooting operations, but at best the results were too indifferent to arouse much interest; and there seems to be no long-term record of persistent use. The acute manpower shortages which developed during World War II brought about a renewal of interest in the drop ball, and a few operators began experimenting with the device solely from the standpoint of its labor-saving possibilities.

About all they inherited from earlier experimenters was a fairly well-established preference for a ball with the vertical axis longer than the horizontal, since it had been found that spherical balls, either captive or free, bounced or rolled considerable distances after landing. Starting with this slim clue, modern operators in an incredibly short time have evolved designs and operating techniques which establish the drop ball as a permanent auxiliary tool in many quarries. It is the purpose of this discussion to review briefly the findings of some of the companies which have contributed to the development of the drop ball, and to appraise generally its application and value to the crushed stone industry.

• A view of the crane and drop ball used by the Lynn Sand & Stone Company of Swampscott, Mass. The crane is a ½-cu.-yd. model with a 60-foot boom. Note the long treads and the high gantry.

One of the most energetic and eloquent advocates of the drop ball is Ted Cooke, president of the Lynn Sand & Stone Company of Swampscott, Mass. Through his co-chairmanship of the operating men's sessions of the National Crushed Stone Association for the past several years, he has done more than perhaps anyone else in the industry to crystallize mere interest in the subject into definite, constructive action.

The company has one of the most serious oversize stone problems in the country. About 30 percent of the stone brought down in an average initial blast is too large for the primary crusher. The hard, tough, abrasive stone is exceedingly difficult to drill and even more difficult to blast. Prior to the successful application of the drop ball, a crew of ten men was required to keep up with secondary blasting; the group consisted of six jackhammer operators, a light drifter operator, a blaster and helper, and a drill sharpener.

When the labor supply tightened up during the war, the company was faced with a choice between curtailing operations or finding a substitute for secondary blasting. Since the drop ball represented the only feasible alternative, Mr. Cooke concentrated his efforts in this direction to such good effect that he now regards it as highly probable that the company will never resume secondary blasting operations.

• Left: This closeup of the drop ball shows the latest product of one company's research. The bloom is octagonal in shape, measuring 22½ inches across the flats and 48 inches high. Note the large bearing area obtained with this single-cable hitch.

• Right: The renewable wearing shoe of the Lynn drop ball is chrome vanadium steel. It is welded to the .40 carbon steel upper section.

A number of different sizes, shapes and hitches have been tried at the Lynn quarry with varying degrees of success. The most promising design (and the one which is currently in use) is an octagon-shaped bloom measuring 22½ inches across flats and 48 inches in length. It has a renewable chrome-vanadium steel section at the impact end, which is welded to an upper section consisting of .30 to .40 carbon steel. The upper section is slotted to receive an ordinary steel sheave which is welded solidly in place to provide the maximum bearing area for the cable.

When new the ball weighs just under 6,500 pounds, which Mr. Cooke feels is probably the maximum weight which should be used. The wearing end, which initially weighs about 1,800 pounds, is replaced after it has lost approximately 1,200 pounds; this is done with a view to holding the minimum weight of the complete unit to 5,000 pounds. The renewable wearing section was developed in order to avoid having to discard the more costly upper section (containing the hitch) when the weight of the drop ball falls below the apparent optimum level of 5,000 pounds. A special welding rod is used for joining the two sections together. On the first attempt the 3-inch, V-shaped weld used required about 200 pounds of rod. Later it was found that a superior job could be done with only 100 pounds of rod by using a 3-inch, 45-degree chamfer on one surface only.

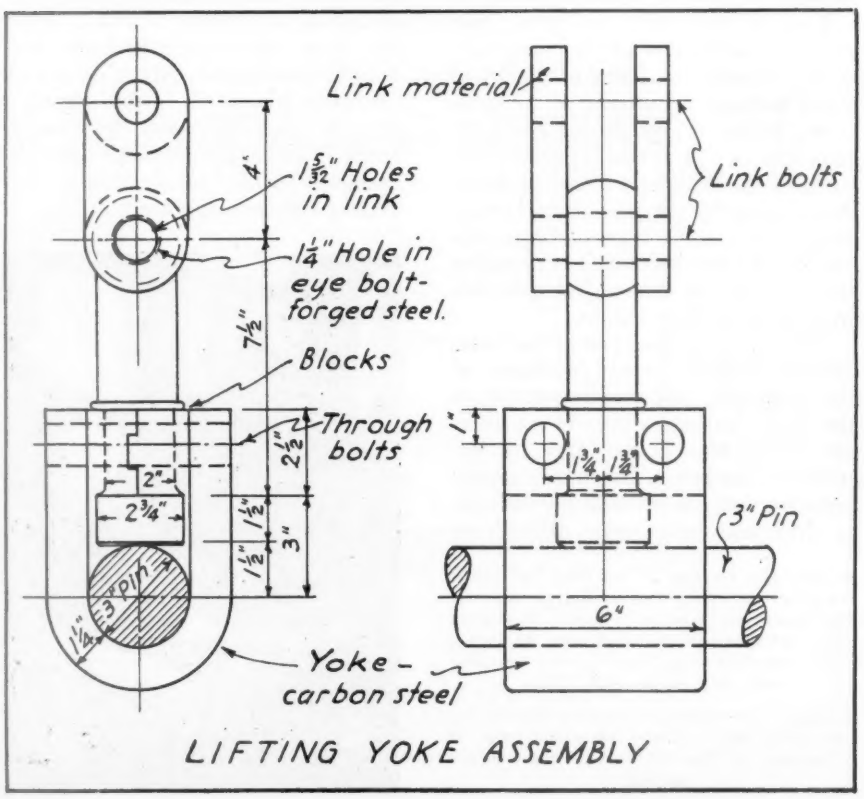
To a large extent the successful use of the drop ball in any quarry seems to be dependent upon the skill of the operator and the suitability of the crane used. Recognizing that the job not only required but fully justified a good machine, the Lynn company has invested $26,000 in a 1½-cu.-yd. Marion crane which is used almost exclusively for the operation of the drop ball. A special, semi-flexible, all-welded tubular steel boom is used. The operator gets control, however, by raising and lowering the boom rather than swinging it on the radius. It has been found that with a live boom hoist the operator can make accurate hits within a 10- to 15-foot band without moving the crane.

The drop ball has an impressive list of accomplishments to its credit in the case of the Lynn Sand & Stone Company. With it one crane operator is now doing work which formerly required a crew of ten men. It is being used to reduce about 30 percent of all the material quarried, and it is doing, according to Mr. Cooke, a considerably better job than was ever accomplished by means of secondary blasting. It reduces stones weighing up to 30 tons at the rate of 20 or more per hour, operating hour-for-hour with the shovel. The cost savings go far beyond the mere reduction of payroll by reducing the purchase of drill steel, drills and drill parts, by eliminating the dynamite, caps and fuse wire formerly consumed in secondary blasting, and by doing away with the nuisance and expense of piping air to jackhammers at the quarry face.

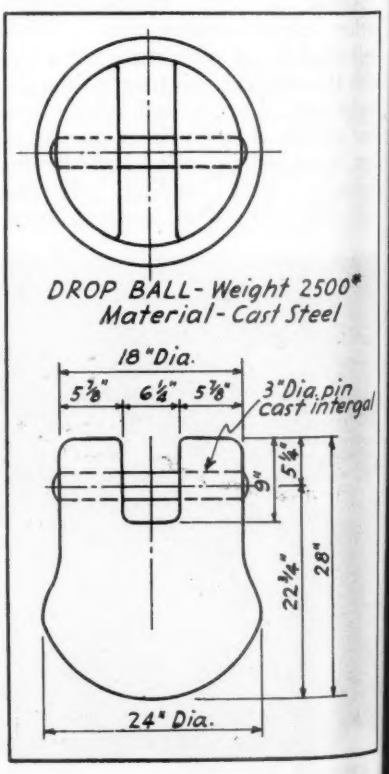
Perhaps even more important, in the long run, are the safety aspects of the drop ball. Half the injuries formerly incurred by employees of Mr. Cooke's company were sustained by men working in the drill gang on secondary blasting. Quarry operators are almost unanimous in agreeing that accidents cannot be avoided so long as men are required to work close to the ledge, where footing is bound to be extremely poor and the hazard of falling rock is ever present. The drop ball not only dispenses with the necessity for such exposure, but it provides an extremely effective means of trimming dangerous ledge — by all odds the most hazardous job in the quarry when performed manually.

Inevitably the operator of the drop ball crane incurs some risk of injury from the flying rock and chips. At first the Lynn company used a wire screen across the front of the operator's cage, but this had the disadvantage of interfering with vision. Recently an 18- by 36-inch Plexiglass plate, mounted in rubber, was put in service to provide the necessary protection without obstructing vision. The plate is set on an angle so that most of the hits carom off.

- Below: The lifting yoke assembly used with the Corson cast steel drop ball.
- Right: The pear-shaped drop ball used by the Corson company.



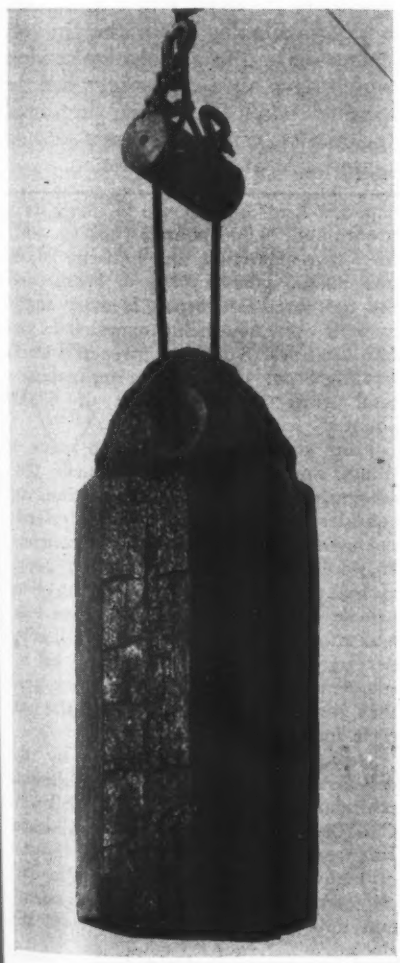
LIFTING YOKE ASSEMBLY



It can be dented by large rocks, but will not crack or splinter.

The New Enterprise Stone Company of Roaring Spring, Pa., has been using the drop ball for about two years, although an unsuccessful tryout was undertaken several years ago. The latest and more successful attempt was brought about, as in the case of the Lynn company, by the critical shortage of drillers. A 30-inch ball weighing approximately 5,000 pounds is used at present, but a 7,000-pound forged-steel ball has been ordered. A cable hitch, doubled around a 2½-inch-diameter shaft, passes through two eyes in the ball and then through an eye in the hoisting cable, where it is fastened with clamps. The hitch to the ⅞-inch hoisting cable is about 4 feet above the ball. The crane used with the drop ball has a 45-foot boom. A tag line is used to draw the ball back, and the ball is usually thrown rather than dropped vertically.

The company has had little trouble with cable breakage. This is attributed to the fact that the operator is not permitted to slap stone with the drop ball, but is required to drop it straight down or to pitch out. This precaution also reduces the possibility of damaging the boom.



• The Cape Ann drop ball has a forged-steel lug for the cable hitch. It is made in various weights, from 2,000 to 8,000 pounds.

New York Trap Rock has found that the drop ball more than pays for itself by reducing delays at the primary crusher. When oversize was reduced by drilling and blasting, there was inevitably a tendency to pass up some moderately large pieces in the hope that they would go through the crusher as they were. According to L. F. Miller of the New York Trap Rock Corp., "The fellow with the ball just busts everything in sight."

Operators who have tried out the drop ball are by no means unanimous in their approval. Harry T. Campbell Sons' Corp. of Towson, Md., tried out a 7,000-pound billet for a number of months and found the experiment rather costly. One of the more serious difficulties encountered was lost time due to frequent breaking of cables. The cable was hooked to a staple in the top end of the billet, which, in the opinion of Bruce S. Campbell, president of the company, leaves a great deal to be desired.

Mr. Campbell found that the crane operator had a natural tendency to raise the drop ball the maximum distance, whereas a drop of 6 or 10 feet was usually adequate for ordinary stones. Considerably less cable trouble was experienced when shorter drops were used. The company also learned, after breaking three booms, that the drop ball requires an experienced, intelligent operator on the crane.

In summing up his company's experience with the drop ball, Mr. Campbell concedes that the device kept up quarry production when manpower was scarce. From an economy standpoint, however, he has some reservations. At the company's Texas, Md., quarry, he advises us, four men and a little dynamite can do the same work that was done with the drop ball.

Palmetto Quarries Company, Columbia, S. C., has been operating a drop ball for more than two years. A cylindrical 5,000-pound, .20 carbon forged steel billet is used with a ¾-inch double chain and swivel hitch. The crane used with this drop ball has a 40-foot boom, and stones weighing up to 20 tons are broken. This company, like many others, adopted the drop ball wholly as an expedient during the labor shortage, and its experience so far seems to cast some doubt on the economy of this method of reducing oversize stone.

The Bryan Rock & Sand Company (formerly Bryan-Monroe Company) used a drop ball at its Rolesville, N. C., quarry for a number of months. The ball was made from a

• A view of the Cape Ann breaker in action. Photographing a drop ball in action at this close range comes under the heading of very hazardous undertakings, since fragments may fly as far as 200 feet.

30-inch crusher shaft weighing about 6,000 pounds, which was handled with a 1-cu.-yd. P & H crane with a 50-foot boom. Eyes were welded to the end of the shaft for a multiple-cable hitch to a ¾-inch hoist line. The crane and drop ball replaced 8 men in the quarry, and the overall performance seems to have been satisfactory. The practice has been discontinued at Rolesville because the crane proved to be too light for the work, but a new 1½-cu.-yd. crane with a 50-foot boom is being sought for use with the drop ball. The company plans ultimately to use a 6,000-pound Allis-Chalmers ball with a renewable manganese shoe.

From the foregoing discussion it is evident that the drop ball technique in quarry operations is still in its infancy, and that a great deal of spade work remains to be done before any generally acceptable practice may be expected to evolve. Practice in most quarries today shows radical differences with respect to both major and minor considerations. For example, some operators wait until the ball comes to rest before applying the hoist brakes, while others, without any follow-through, apply the brakes at the moment of impact. Some have tried a small steel ball on the cable above the drop ball to allow the hoist line to follow through smoothly after the impact of the breaker, and to give the operator time in which to apply the brakes. Fouling of hoist lines, with resulting loss of time and damage to cables, has been one of the more serious problems in connection

with operation of the drop ball, and this fact, taken in combination with the wide disparity in practice, suggests that there are still some fundamental principles to be evolved.

The same observation applies with equal force to the type of hitch used, although it is conceivable that there may be several satisfactory solutions to this problem. Some operators who have used chain hitches report that breakage is so frequent that they do well to keep the crane in operation for more than 30 minutes out of every hour. This sort of business can obviously more than cancel the economies sought with the drop ball. Where cable hitches are used, and fastened with "U" clamps, the time required to replace broken loops also becomes an important factor. We have heard of one operator who keeps precut lengths of old cable right on the crane for replacing broken loops. In place of clamps, he ties the cable in a huge square knot which is tightened by the weight of the drop ball when the load line is taken in. This replacement can be carried out in about 5 minutes as against a minimum of 20 or 25 minutes when "U" clamps are used.

On the basis of the meager evidence now available, it would seem that a drop ball is economically feasible if it replaces not fewer than five men in the quarry. This yardstick will usually apply even when it is necessary to purchase a crane for the job. As Ted Cooke pointed out when he discussed this subject with us several months ago, a crane is a most versatile and useful piece of equipment around any quarry operation, and there is some question as to whether its entire cost should be charged to secondary breaking. On a single hoist line at 45-foot radius, the ideal drop ball crane should be capable of handling a 3-ton load. For stability it should have extra long crawlers, and a high gantry to limit bouncing of the boom. The hoist drum should wrap only one layer of cable. Proper length of boom still seems to be in the controversial category, and it may well be that the decision on this point should be based wholly on local conditions. It would seem, however, that under most conditions the minimum length of boom should be 50 feet.

Discussions at the operating men's sessions of the National Crushed Stone Association for the past several years have clearly indicated that there is wide interest in the drop ball, and a large field for its applications. If the drop ball failed in a given instance to show a dime of savings as compared with conventional secondary drilling and blasting procedure, we think its adoption might be fully justified from the standpoint of safety alone. Certainly one man stationed in a well-constructed crane cab can be protected more readily and more effectively than a crew of six or more working in the open and exposed to the constant hazard of falling stone.

Equipment manufacturers can, and undoubtedly will, render valuable assistance in the further development of the drop ball as soon as strikes, material shortages and heavy backlogs of orders cease to discourage branching out into new lines. Several quarries in New England have for a number of years used drop balls manufactured by the Cape Ann Anchor & Forge Company. These balls have an octagonal cross section and are forged from .40 to .50 carbon steel. They are made in a range of sizes varying in weight from 2,000 to 8,000 pounds, and are furnished either with or without hoisting attachments. The hoisting lug is forged as an integral part of the ball.

Allis-Chalmers is reported to be developing what it calls a "drop hammer." It will weigh 4,500 pounds, have a hexagonal cross section measuring 27 inches across the flats, and will feature a replaceable manganese steel shoe. Other manufacturers will probably have something to offer drop ball users in the near future.

It seems safe to predict on the basis of facts available at present that the drop ball is here to stay. Its performance clearly indicates that it is far more than a stopgap-measure to be adopted when manpower is not available. With the fine cooperation and free exchange of ideas which have always characterized the crushed stone industry, improved techniques and equipment should materialize at a rapid rate.

American Road Builders Hold Convention in Chicago

After a day and a half of pre-convention meetings, the 44th Annual American Road Builders' Association Convention was opened at 2:30 p.m. Monday, February 17, at the Palmer House in Chicago. The opening address was delivered by the outgoing president, James J. Skelly, of the James J. Skelly Co., contractors, Media, Pa. In his report to the convention on his second year in office, Mr. Skelly told of the Inter-American Highway training course, sponsored by the A.R.B.A., which brought 35 engineers from Latin America and other countries to study the highway equipment, materials and methods used in the United States. It was also announced that the first post-war "Road Show" would be held in the Tucker plant, near Chicago, in February of next year.

At the technical session, Tuesday, February 18, H. F. Thomson, vice-president, General Material Co., St. Louis, Mo., reviewed the *Trend of Truck Weights in the Ready Mixed Concrete Industry.* As the chairman of the committee on truck chassis, National Ready Mixed Concrete Association, Mr. Thomson was able to present a concise and interesting paper on this subject.

The ready mixed concrete industry, he said, has attained such stature in the past 25 years that it now uses nearly 15 percent of all the portland cement manufactured in this country. At first, in the early operations, the concrete was completely mixed in stationary mixers and hauled to the job in ordinary dump trucks. Later on, however, various styles of revolving drum bodies made their appearance, and in recent years there has been a steady trend throughout the industry toward heavier truck equipment.

The usual state highway regulations with reference to length, width, and height of truck are not at present a handicap to the ready-mixed concrete industry.

In general, truck length does not exceed 22 feet. Trailers and semi-trailers are not used in this industry because of the need for maneuverability.

The usual width limitation, 96 inches, affects only the very largest equipment now in service, and as the height of present trucks is under 12 feet, they are therefore well within the usual limits. Weight limitations, however, frequently represent a severe handicap on the efficient operation of this industry. Typical capacity loads of concrete in many states are around 24,000 pounds (2¾ cu. yds.) for a two-axle truck and between 28,000 and 32,000 pounds (4½ to 5 cu. yds.) for the three-axle type. Heavier equipment is even now being operated in certain localities. There are three-axle trucks hauling 8 cu. yds. of concrete, making a total gross vehicle weight of 62,000 pounds.

From studies that have been made, it would appear that larger trucks than recognized by most state limitations are considered by many operators as offering the most economical delivery of concrete. It would appear, therefore, that design of highways and highway structures for heavier wheel and gross loads than have heretofore been carried may become necessary to permit realization of the economies offered by heavier truck units than those now in general use in the concrete industry.

New officers were elected by the A.R.B.A., to take office in the following positions: president, J. T. Callaway, Goodyear Tire and Rubber Co., Chicago, Ill.; treasurer, H. C. Whitehurst, director of highways, District of Columbia, (re-elected). New regional vice-presidents, and new divisional presidents were also elected.

THE LIME PLANT OPERATOR

BY WOLF G. BAUER

HYDRATION IN THEORY AND PRACTICE
Part V—Stage Processing Control

Wolf G. Bauer

In stage processing control two factors must be considered — the establishment of optimum processing conditions, and the maintenance of same. The first is generally a matter of design and provisions for lime preparation, while the latter deals with manual or automatic regulation during the processing.

In designing or making certain design alterations, we must first consider the characteristics of the lime. If a very hot and explosive type lime will have to be hydrated, the depression of the detrimental peak-reaction temperature is of first concern. If a slow reacting type lime is to be hydrated, the early production and maintenance of optimum temperature, as well as maximum heat conservation for the longest process time is to be aimed for. If both types of lime must be handled, the hydrator must be designed for great flexibility in regulating lime retention time in each stage.

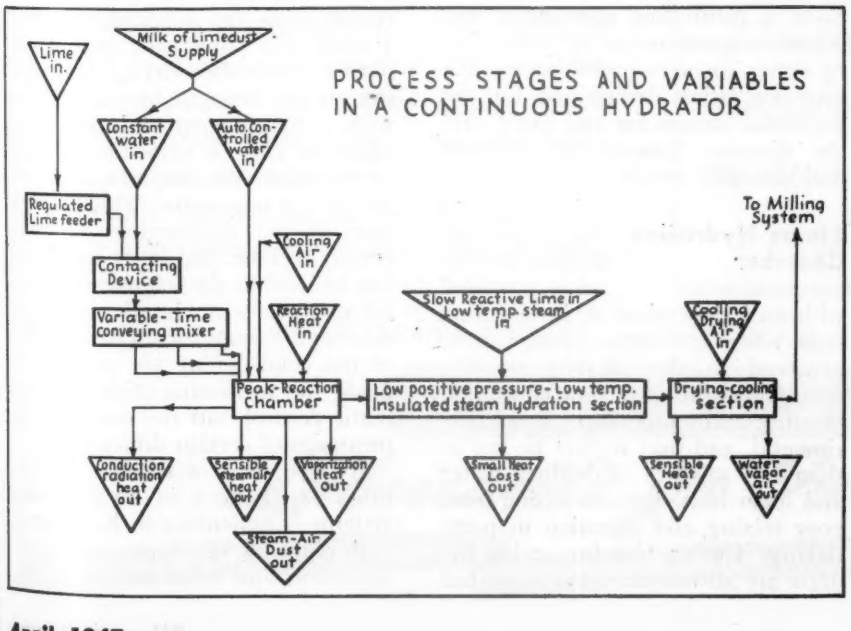
The accompanying illustration represents in a diagrammatic flow sheet form the major process stages of a continuous hydrator. It can be seen that regulation of the variables affecting each stage can succeed only if these stages are understood, and separated through correct design.

In the writer's opinion, good design calls for six controlled stages as follows: (1) feeding and proportioning of lime and water; (2) intimate contacting and wetting of every lime particle; (3) conveyance and regulated retention of the lime for pre-reaction time interval; (4) peak-reaction temperature control; (5) steam finishing hydration; (6) conditioning through cooling and drying.

Preliminary Stages Controlling lime feed by constant weight or volume feeders, and water by flow meters, such as differential orifice, valve back-pressure, and rotameter type has been discussed earlier. Some lime-water contacting techniques and factors have also been indicated. The next stage is the pre-reaction phase. To control this, i.e., to separate it from the peak-reaction stage, a variable speed mixing conveyor can be employed. An alternate or added feature consists of changing the length of the conveying path by terminating the travel at any suitable point along the conveyor through discharge openings provided at intervals, as shown in the illustration.

Reaction Stage Temperature is not a function of the number of heat units released, but is rather dependent on the time interval in which this release takes place. That is why hydrators ought to be designed in such a way that this exact time interval within the total hydration cycle is determined and isolated. And so the fourth, or peak-reaction stage, becomes the most crucial stage, where positive time-temperature regulation must be provided. Attempts at automatic water regulation in ordinary deep, flooded bed hydrators by continuous lime-steam mass temperature measurements have been unrewarding. A parallel can be drawn in some ways to lime temperature control in a kiln through the measurement of exhaust gas temperatures. The reasons why hydration temperatures cannot be controlled in flooded deep-bed hydrators have been intimated in previous detailed discussions. The point is obvious. The thinner a continuous moving stream is spread out, the more thoroughly and positively can it be reacted upon by outside agents, and without affecting adjacent stream portions.

The diagram shows that heat is removed by radiation and conduction losses of the reaction chamber, by the heating of excess water, by the great endothermic reaction of changing water to steam, and by the heating of cooling air by convection. These heat-removing agents are brought into fullest controlled play through design features of the agitator and chamber, and the regula-



• Diagram showing heat removal agents.

tion of cooling water and cooling air in contact with the lime at its height of heat generation. Automatic temperature control of lime through cooling air and water is not only desirable, but essential and possible at this point, provided that hydration is divided into separate continuous stages as outlined.

To dissipate some of this detrimental initial heat for hydration quickly and effectively requires ample provisions of all of these heat-absorbing agents. To glean some idea of the heat involved, we might remember that for every five tons of coal burned to make a certain amount of lime, this same quantity of lime returns the equivalent of one ton of coal in heat of hydration. This is another way of saying that every 25 tons of lime hydrated release the equivalent of one ton of coal. (Actually, of course, only a part of this heat would be available, as a certain portion is molecular heat of transformation during the water phase change.)

Variations in lime mass temperature at any one point along the moving stream of reacting lime are due to variations in amount and type of reactive lime. As pointed out before, even a constant-weight feeder cannot compensate for extra core weight, while a constant-volume feeder does not allow for changes in bulk stream density due to size gradations or material burning shrinkage. Because of these variables (which should be minimized by proper sorting and crushing ahead of feeders), the cooling effect of the constant-flow water addition will fluctuate, and with it the temperature.

It is impossible to hold lime stream temperature constant by automatic regulation, but it is possible to narrow the temperature fluctuations into a controlling range that will prevent detrimentally high or low deviations from normal. The reason for this is simple. Lime stream temperature at one point may drop due to a decrease in reactive lime because of core, recarbonation, or air-slaking; or it may drop because reactive lime has a longer pre-reaction period. In one case less cooling water is required in order to bring the temperature back to optimum normal, while in the second case, the requisite temperature is reached later and farther along the stream path.

Peak-Reaction Chamber This chamber may take the form of a rectangular steel box with a single or double cylindrical bottom, containing preferably two shafts with paddles revolving in opposite directions and at a variable speed up to 100 r.p.m. In order to obtain maximum heat absorption when that becomes necessary with a particularly highly-reactive lime, close clearances of paddle tips with the steel bottom and sides should be maintained, so that no insulation of dead lime forms under the moving reaction stream bed of lime. The trough bottom may be double-walled and air-cooled, using this air for last stage drying needs. The lime stream should be baffled above its surface at various intervals, in order to cause the cooling air currents to sweep close over the stream bed. Paddle blades should have close clearances with each other to stay clean. Blade pitch may also be made adjustable so that retention time may be varied without changing agitation speed.

If a liquid- or a gas-expansion type thermo-element is used, it should not be sheathed. Paddle blade edges must have very close clearance both on the top and the sides of this measuring element, in order to keep lime from building up around it. Its length must be such that it is at all times covered by the lime stream, and does not protrude into the steam and cooling air stream. It must be located at a point along the stream which is just past the maximum reaction zone, and ahead of the stream entry to the steam hydration chamber. The water cooling spray must not be allowed to wet it, but be located very close and just ahead over the spot of average maximum temperature.

A recording controller instrument is preferred, having variable-range quick-acting high and low contacts to regulate cooling water admission. Such a controlling instrument will actuate a quick-acting butterfly valve by either air or reversible motor, the time lag being determined for the particular stream size and speed, and the distance between the element and the spray nozzle.

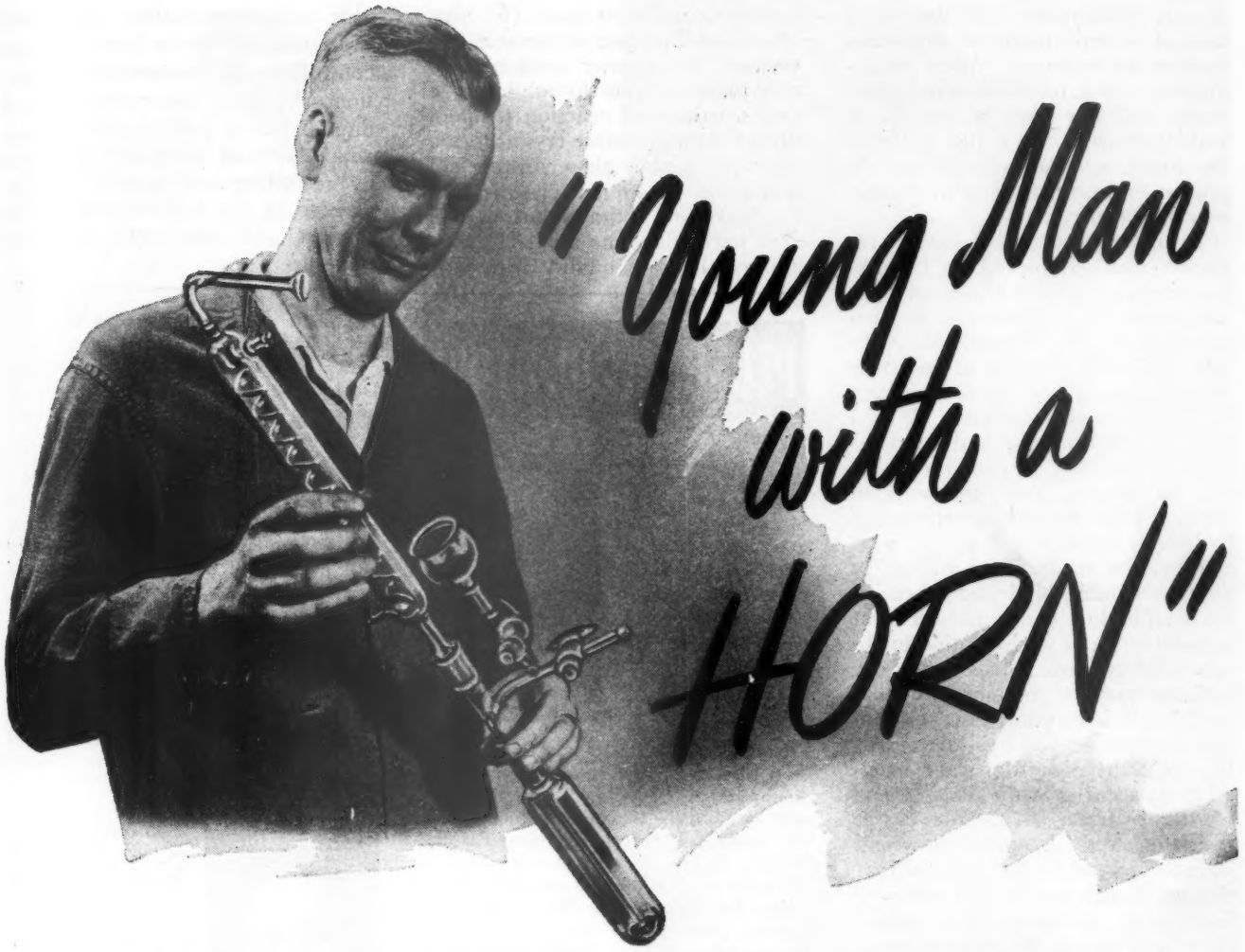
Steam Hydration Chamber An all-purpose flexible hydrator is provided with an independent steam-finishing stage where maximum curing can be achieved in the shortest possible time. Steam itself, at low controlled pressure and temperature is not detrimental, and may in fact be less so than the mixture of boiling water and super-heated steam arising from poor mixing and agitation in putty slaking. Curing bins for ageing hydrate are all very fine, of course, but such curing is slow and uncontrolled. As much as possible of this after-curing ought to be accomplished in the hydrator while the slow heat release is still effectively augmented by the sensible heat in the lime and water.

This chamber holds the greatest quantity of lime. Through insulation and steam pressure control above atmospheric, slow-reacting particles of lime complete the hydration cycle under process-hastening temperature and moisture conditions, and without injury to already formed hydrate. Slow generation of heat is here balanced with heat losses, sufficient mechanical moisture being retained as steam and vapor under slight pressure, or added as extra wetting water of incoming lime or through humidifying sprays. By judicious use of stream baffling, the designer can prevent short-circuiting of the slow-moving steam-aerated bed, propelled by slow-turning paddles which lift as well as plow the material for maximum surface exposure. Since no gas velocities are maintained in this section, no dust loss occurs.

It should be kept in mind that output rate and process time must always be controlled *independently* of each other, as, normally, one is a function of the other. There are many ways to design this section of the hydrator, much depending on detail refinements of process regulation that may be necessary or warranted according to hydrator output and lime type.

Drying and Cooling Section The last section may be designated as the conditioning section in which the temperature and the moisture of the hydrate are adjusted for optimum results with the particular air-separating and pulverizing system employed. Controlled drying and cooling air are brought here in contact with a thin stream of lime. Lime agitation and air velocities are kept at the minimum, exposed lime surface at the maximum. The temperature of the discharging lime can readily be indicated or recorded, and can be used as the sole measurement for manual or automatic control of this conditioning air. The humidity of the conditioning air can also be made the measuring stick for automatic control, but the dust entrainment causes certain difficulties.

A good deal of trouble is sometimes experienced in air-separating systems — difficulties in building up and plugging of chutes, conveyors, separators and mills, and in low sep-



"Young Man with a HORN"

What appears to be a glass saxophone in the hands of a Sinclair Laboratory technician is in reality an important instrument used in protecting you against lubricants with low resistance to oxidation.

It's part of Sinclair's apparatus to determine oxidation rate of both non-additive and additive type lubricants. It is used constantly by Sinclair in Research and Refinery Control to assure you of maximum lubricant life without formation of harmful corrosive acids, varnish or carbon deposits on working surfaces.

Resistance to Oxidation is a prime requisite of all good lubricants. Sinclair's "Young Man With A Horn" — and others equally painstaking — stand guard constantly at Sinclair Laboratories to assure you that any Sinclair Lubricant you buy has the very highest degree of quality necessary for maximum operating efficiency.

Sinclair Automotive Lubricants

For Engines:

OPALINE MOTOR OIL

OPALINE TBT MOTOR OIL
(For severe service)

TENOL (Heavy Duty — For Diesels)

For Gears:

OPALINE GEAR LUBRICANTS

For Chassis:

OPALINE CHASSIS LUBRICANT

For Wheel Bearings:

SINCOLUBE

SINCLAIR REFINING COMPANY • 630 FIFTH AVENUE, NEW YORK 20, N. Y.

SINCLAIR

Lubricants for Industry

FINEST CRUDES + EXPERT RESEARCH and MANUFACTURING CONTROL = OUTSTANDING PERFORMANCE

arating efficiencies — all due to a lack of understanding of the functions of the hydrator. When the hydrate is cooled, mechanical or hygroscopic moisture may be present in varying degrees. It is just as much the function of a hydrator to add process moisture, as it is to remove excess moisture.

In the early stages of moisture removal, water is picked up by drying air in proportion to the quantity circulated in contact with the exposed surface of the material. After the minimum amount of moisture remains, the drying rate is much less dependent on the amount of air used than on the humidity and temperature of that air. Hence, preheated dry air flowing countercurrent in contact with the flowing stream of hydrate is essential.

Why, the reader may ask, go to all that trouble of drying when all we need to do is to add just the right amount of water for hydration to obtain a dry product? It is true, a dry hydrate may be obtained in that way, but it is certainly not true that this amount of water is necessarily the optimum amount of water needed for processing at the reaction end of the hydrator. Many hydrator operators and designers, however, seem to proceed on just that assumption, as though nature had endowed lime with precisely the correct amount of chemical energy to evaporate the exact quantity of cooling water necessary for best hydrating conditions. The fact that there is an excess of heat available to evaporate this water does not mean that we should squander it haphazardly, but rather conserve it to do the necessary drying job at the right time. It is the very fact that this extra heat is available that makes it possible to use the right amount of temperature-depressing cooling water in large quantities, provided that we save enough of that excess heat for drying use in the conditioning stage, and not let it pass out of the stack as a mixture of air and steam or vapor. Drying technology is a field all its own, and we cannot go into the details of its mechanics at this time.

Advantages of Stage-Controlled Hydration Depending on the lime type and product specifications, we may expect some of the following, and often very noticeable, improvements in the process and product after re-designing an existing machine, or after employing one designed and enginered to fit the lime: (a) fewer rejects consisting of overheated or unslaked lime; (b) higher availability due to greater conversion; (c) greater surface factor and plasticity due to inhibition of excessive internal reaction temperatures favoring coarser crystal formation; (d) higher air-separating efficiencies in subsequent classification; (e) increased hydrator output with each particular lime type; (f) more uniform hydrate quality with variable quicklime quality; (g) better utilization of inferior limes by closer controlled time-temperature regulation; (h) lower labor cost; (i) and duplication of good results through adaptability of automatic regulation by recording instruments and the division of the hydration cycle into distinct and separately controlled stages.

PERSONAL MENTION

Col. Harry A. Montgomery

The appointment of COLONEL HARRY A. MONTGOMERY as vice-president and chief engineer of the Material Service Corporation and subsidiaries was recently announced by the Chicago firm.

Colonel Montgomery was formerly division engineer, Great Lakes Division, of the Corps of Engineers, Chicago, and more recently chief engineer with the American Forces, Western Pacific, Manila, P. I.

For his work as division engineer, Great Lakes Division, during World War II Colonel Montgomery was awarded the Distinguished Service Medal by General R. A. Wheeler. He was retired from the army at his own request after 28 years of service in the Corps of Engineers.

J. McElrath

N. J. MCELRATH has been made service engineer for the Hermitage Portland Cement Company, of Nashville, Tenn. His long experience in all phases of concrete engineering matters will be available as a company service, upon request to the Hermitage general offices in the American Trust Building, Nashville, or through any Hermitage sales representative.

Mr. McElrath has served with the Kentucky State Highway Department, with the U. S. Engineers in the Memphis District, and the Tennessee Valley Authority.

In announcing this appointment to the Hermitage staff, President E. W. McGovern stated that the addition was in line with the company's expanding program of offering the fullest service to those concerned with cement and concrete in the Southeastern states.

The appointment of WILLIAM CASPARI to the position of general sales manager of the Davison Chemical Corporation, Phosphate Rock Division, Bartow, Fla., has been announced by company officials.

Mr. Caspari began his career with Davison 31 years ago in the chemical laboratory. He served in various capacities in the corporation's fertilizer and chemical operations and spent a number of years on Davison properties in Cuba.

In addition to his duties as general sales manager of Davison's Phosphate Rock Division at Bartow, he is general sales manager of the Superphosphate and Export Divisions.

DONALD N. WATKINS, chairman of Steel Publications, Inc., of Pittsburgh, Pa., has been named president of the Laclede-Christy Clay Products Company of St. Louis, Mo. The firm manufactures refractories, with plants in Ohio, Missouri and Alabama.

Albert Fowler

ALBERT C. FOWLER was recently named chief chemist of the Huron Portland Cement Company of Detroit, Mich., according to an announcement released by the firm, to succeed W. MARSHALL SMITH.

Mr. Fowler joined the firm in 1931 and was made assistant chief chemist at the Alpena plant in 1940.

Mr. Smith retired from his duties after 39 years of service as chief chemist with Huron.

L. R. FORBRICH, who was until recently chemical research engineer with the Bessemer Limestone and Cement Company, Youngstown, O., has been named chief chemist of the Green Bag Cement Company of Pennsylvania at Pittsburgh.

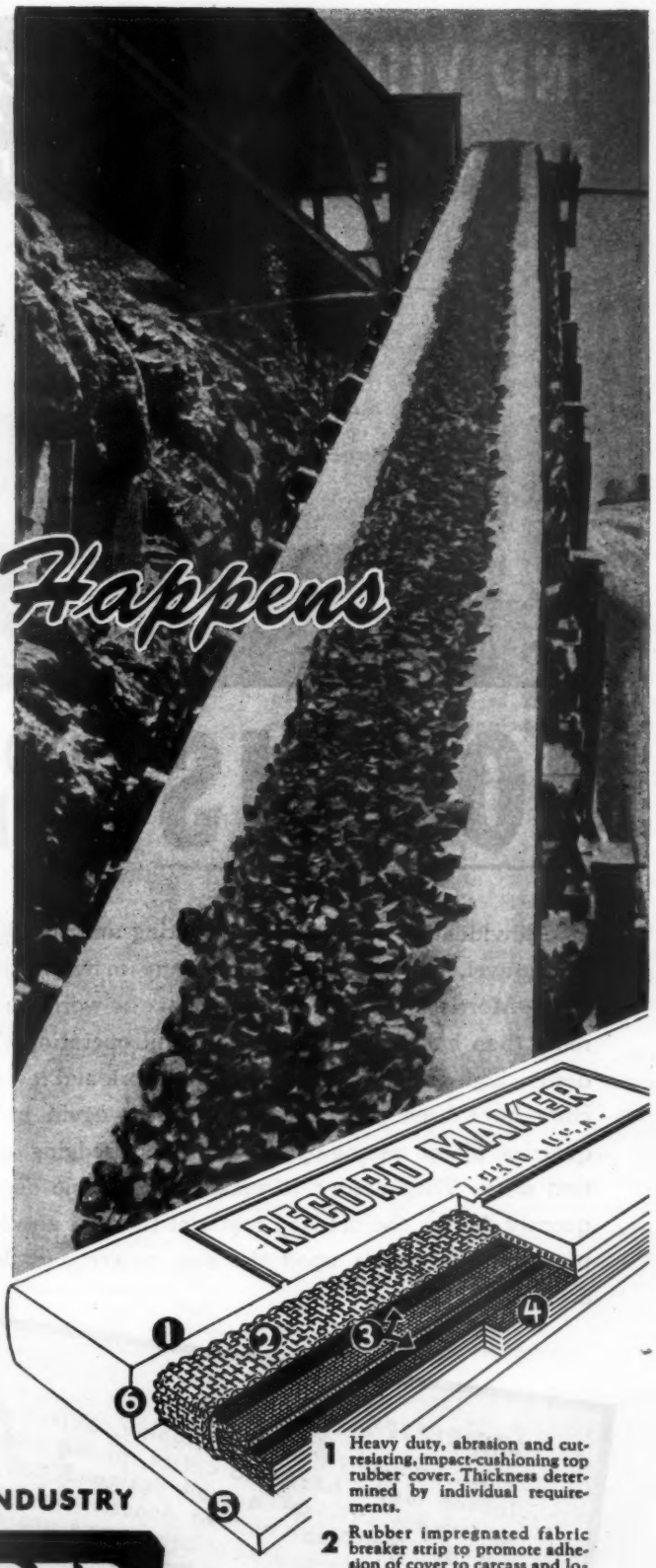
A. L. CURTIS has been named district sales manager for the Lone Star Cement Corporation's Indiana Division, to succeed J. E. SIMPSON, who has resigned. His office will be in Chicago.

DR. A. ALLEN BATES, vice-president of research and development at the Portland Cement Association in Chicago, recently addressed the members of the City Club of Cleveland, O., on the subject, "An Engineer Looks at the Future."

Effective February 28, 1947, H. E. KERBY, general purchasing agent, Lone

MATERIAL HANDLING News THAT IS WRITTEN *Before it Happens*

REPUBLIC Conveyor Belting has been making news in the Stone Products industry for years... repeatedly showing new peaks of belt life, total tonnages hauled. Of course this increased service doesn't just happen. Republic technologists make detailed analyses of specific operating conditions prior to belt recommendations. Then, going a step farther, they hold the actual belt building under close laboratory supervision to assure compliance with requirements indicated. With such engineering and construction for specific uses, Republic Conveyor Belting proves the answer to excessive belt wear, premature failure, on the toughest applications. Ask your Republic Distributor for a report on installations in your territory.



1 Heavy duty, abrasion and cut-resisting, impact-cushioning top rubber cover. Thickness determined by individual requirements.

2 Rubber impregnated fabric breaker strip to promote adhesion of cover to carcass and localize cuts and tears.

3 Rubber skim between plies to promote flexibility and minimize permeation of moisture into fabric in event of injury to covers.

4 Load carrying carcass of plies of special-woven belt duck—rubber-impregnated—number determined by load and specific service conditions.

5 Bottom cover of same high quality, fatigue and age-resisting rubber as top cover.

6 Heavy cushion edge for protection against side-wear and intrusion of moisture.

MORE SERVICE FROM RUBBER FOR INDUSTRY

REPUBLIC RUBBER

DIVISION

LEE RUBBER & TIRE CORPORATION

YOUNGSTOWN 1, OHIO

REPUBLIC INDUSTRIAL PRODUCTS
YOUNGSTOWN O

LEE DELUXE TIRES AND TUBES
CONSHOHOCKEN, PA

INDIVIDUALLY *Designed*
For Specific DREDGING Requirements

MORRIS HYDRAULIC DREDGES

Individually designed for excavating and transporting sand, silt, gravel, clay—in fact, almost any material short of solid rock—Morris Hydraulic Dredges have a world-wide record of more than half a century of successful operation. Their sturdy design, high-grade construction, rapid work and low maintenance costs have been proved over and over again in gravel pits, quarries, placer mining operations, river dredging, and construction work. They dredge to maximum possible depths and frequently deliver the dredged material through a mile or more of pipe line, depending upon the size, power and design of the dredge.

Engineered for the JOB

All components—hull, rigging, hoist, spuds, ladder, ladder head and cutter, piping and miscellaneous fittings—are all designed and built for the individual type of deposit and service. All excavating and auxiliary pumps are of the famous Morris centrifugal type, driven by electric, Diesel or steam power, according to the needs of the job.

Write today for Bulletin 177, illustrating a wide range of types.

MORRIS MACHINE WORKS Baldwinsville, N. Y.
Sales Offices in Principal Cities

MORRIS CENTRIFUGAL PUMPS

Star Cement Corporation, will retire, having completed more than 25 years' service.

Mr. Kerby came to Lone Star in 1921, as chief clerk at the Hudson, N. Y., mill. In 1926 he entered the sales department, and in 1929 was appointed assistant manager for the company in Uruguay. He returned to this country in 1932 as sales manager of the company's Pennsylvania Division, and in 1935 was appointed general purchasing agent.

C. H. Schlutow

Carl H. Schlutow has recently become associated with the sales force of the Alpha Portland Cement Company whose offices are in Easton, Pa., and Chicago. He will cover central-eastern Illinois for his district sales office at St. Louis, Mo.

Mr. Schultow was formerly employed by the Missouri Portland Cement Company, covering western-central Illinois and more recently the East St. Louis-Alton metropolitan area.

OBITUARIES

SAMUEL J. DARK, 80, president of the Rock Asphalt Corporation of Buffalo, died unexpectedly in his home on February 25. Mr. Dark had originally been associated with Pliny McNaughton, William H. Kinch and Frank L. Bapst, deceased, in the Rock Asphalt Corporation, whose interests in the firm he had acquired. He was a director of the Great Lakes Dredge & Dock Corp. of Chicago and was a partner in other construction firms.

LEWIS R. PETERS, 49, traffic manager of the Coplay Cement Company, died of a heart ailment at Sacred Heart hospital, (Catasauqua, Pa.) on March 2. He joined the company as traffic manager six years ago after service with the Jersey Central Railroad.

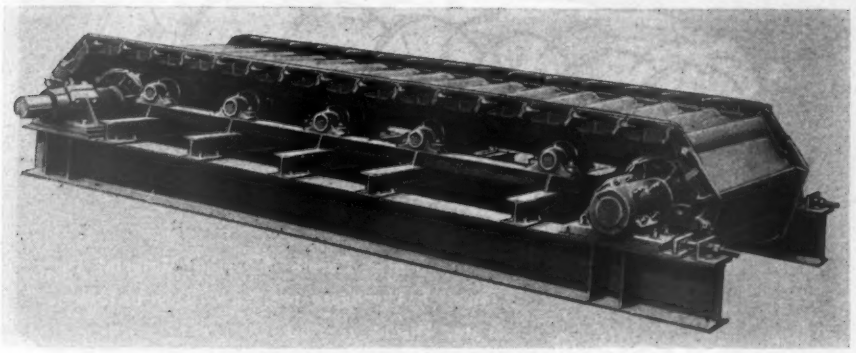
PAUL H. ROHE, 42, owner of the Laughery Gravel Company of Aurora, Ind., died on February 18 of a heart attack.

CLARENCE H. FRENCH, 59, died on February 23 at his home in Brookline, Mass. Mr. French was at one time a foreman in the Alstedd Mica mines.

EARNEST EVERETT SMITH, 67, died on March 9 of a heart attack at his home in Canaan, N. H. Mr. Smith was president of New England Minerals, Inc., which he organized in 1918.

WARREN P. HUMBLE, 44, executive secretary of the Kentucky Association of Highway Contractors and the Kentucky Crushed Stone Association, died March 12 of a heart attack while at the wheel of his automobile near Frankfort, Ky.

New Machinery And Equipment



● Manganese Feeder

For the mining and related heavy industries, the "Pioneer-Oro" manganese feeder, a new product by Pioneer Engineering Works, as licensee under patents held by Kensington Steel Company, combines strength and service.

The feeder is constructed to handle efficiently and at high capacities large tonnages of abrasive or non-abrasive materials such as large lumps of broken stone at quarries and excavation projects. All wearing parts of the feeder are made of Oro Supermang steel.

The apron consists of a series of Oro Supermang double beaded, overlapping and interlocking pans with vertical reinforced side flanges. The under sides of the pans are heavily ribbed to withstand impact and shock. One-piece Oro Supermang links, cast as part of the pans, serve as the chain links and present a continuous flat surface for carrying the apron over a series of rollers. (See illustration at right, above.)

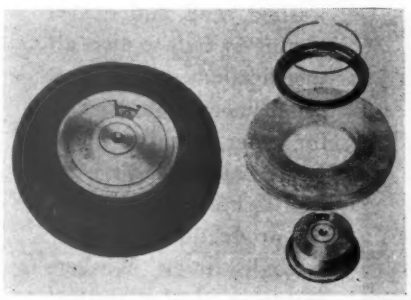
● Multipurpose Unit

Excavating, trenching, filling, loading and boulder handling are all performed by "Gradall," a new multi-purpose earth-moving machine being manufactured by The Warner & Swasey Co., Cleveland.

Telescopic boom.

Gradall consists essentially of an engine-driven, pneumatic-tired chassis, provided with a rotating turntable mounting a 24-foot telescopic boom. By means of hydraulic controls located in the operator's cab, the boom may be extended and retracted, lowered and raised, tilted each way from horizonal, and rotated a full 360 degrees on the turntable.

A variety of interchangeable tools may be attached to the end of the telescopic boom. Two adjustable links provide quick positioning of the alloy steel tools to permit cutting on a vertical face. The tools are pulled into the work, rather than pushed.



This Aerol pneumatic wheel was designed for tire changes in less than one minute. The tire is placed on the main body of the wheel with just enough air to round it out; the detachable rim is slipped in place with the fingers; and the special snap ring is placed in position. The manufacturer, the Aerol Company, 1923 E. Washington Blvd., Los Angeles 21, Calif., states that no tools are needed.

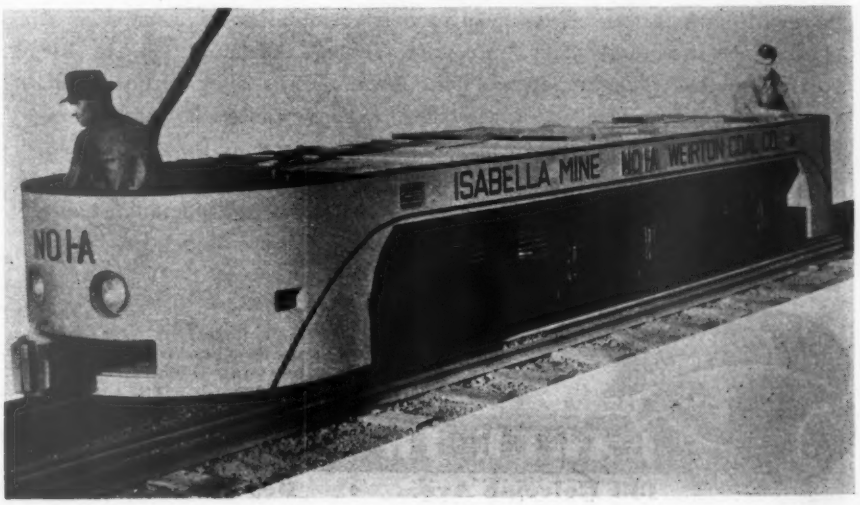
● Mine Locomotive

A new 25-ton, 480-h.p. high-speed electric mine haulage locomotive designed especially for heavy, fast haulage over long runs has been announced by the Transportation Divisions of the General Electric Company.

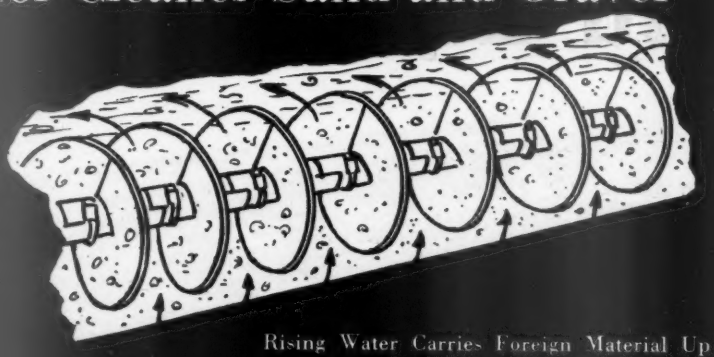
This locomotive is of all-welded steel construction, and it has a top speed of 40 m.p.h. The two-axle swivel trucks provide four-axle distribution of locomotive weight to reduce load and lateral force wear on trackage. The short rigid-wheelbase trucks, with low inertia and swivel connection to the frame, allow free wheel tracking, and minimize binding and strain on both locomotive and rails.

Each axle is driven by a 120-h.p., 250-volt heavy-duty traction motor. Motor-powered blowers provide complete traction motor ventilation. At the continuous rating of the traction motors, the locomotive develops 12,500 pounds tractive effort, which is equivalent to 25 percent adhesion. The rated drawbar pull is 12,500 pounds at a speed of 11.5 m.p.h.

For heavy, fast haulage.

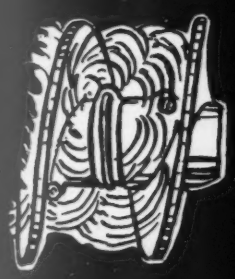


EAGLE DOUBLE ACTION
for Cleaner Sand and Gravel



1

Rising Water Carries Foreign Material Up Through Aggregate and Back Down to Lower Water Discharge End



2

Screws Cause Thorough Scrubbing. Grain against Grain . . . Squeeze Out Excess Moisture

Produce thoroughly washed sand and gravel that never fails to meet all specifications—produce it faster, more economically for lower operating costs. Eagle double washing action assures quality-quantity production.

Eagle Screw Washers feature exclusive method of introducing wash water —a multiplicity of small holes, diminishing in size along entire length of tub toward upper end, force a rising current of water through aggregate as it is conveyed upward by screw. Rising current effects positive removal of all foreign material of lighter specific gravity than aggregate . . . sticks, vegetation, silt, etc., are carried up through aggregate and back down to lower water discharge end.

Tumbling, squeezing action of conveying screw causes thorough grain-against-grain scrubbing action . . . wrings out aggregate for effective dewatering. Standard sizes, single or double screw, to fit every requirement. Similar mechanically but with longer tubs and special settling tanks, Eagle Classifiers and Dehydrators are tailor-made for your job. Send for complete bulletin.

75th Anniversary 1872-1947 Progress...Service

Sand and Gravel Equipment

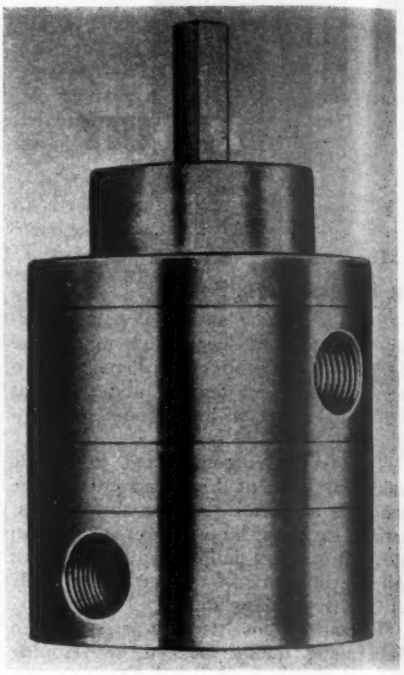
"SWINTEK" DREDGE LADDERS — SCREW WASHERS
LOG WASHERS — DEHYDRATORS — SAND TANKS
CLASSIFIERS — REVOLVING SCREENS

EAGLE IRON WORKS

133 Holcomb Ave. • Des Moines, Iowa

● Rotary Pump

The Ellipse Corporation, Pump Division, 24 S. Clinton Street, Chicago 6, is featuring its Series S-125 rotary pump, designed to handle oils, gases, and water.



Handles oil, gases, water.

Specifications are as follows: capacity, 2.5 g.p.m.; pressure, 1000 p.s.i.; vacuum, 26 in. The S-125 uses 150 viscocity oil at 140 deg. F. for these figures.

Ejection is accomplished by mechanical action of vanes and rotor. Balance components and balanced axial load contribute to low vibration. The Ellipse pump has a uni-directional flow and circular motion. It is self-contained and can be mounted in any position. Also available are larger sizes up to 50 g.p.m.

● Respirator

The M.S.A. "Clear-Vue Dustfoe" respirator offered by the Mine Safety Appliances Company, Pittsburgh, Pa., has a facepiece of formable aluminum to permit a comfortable fit on any face. A soft, flexible face cushion provides a dust-

Device fits comfortably.

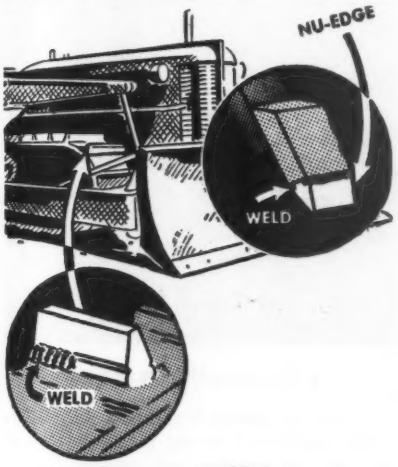
tight seal. The filter container is made of tough, transparent plastic, permitting visual check of filter position, type, and condition.

The economical, single, throwaway-type filters are colored to facilitate instant recognition. The green Type AC filter has an especially low breathing resistance and is recommended for pneumoconlosis-producing and nuisance dusts and mists, and for heavy, fast-clogging dust concentrations. The All-Dust Type is red, providing maximum filtering efficiency against all dusts.

The device has an adjustable elastic headband, and an Army-type exhalation valve.

• Edging Bar

The Allied Steel Products, Inc., of 7835 Broadway, Cleveland 5, O., offers a special steel bar for salvaging bulldozer, drag and maintainer blades. The "Re-



Renews worn blades.

Nu Edge bar, as it is known, can be welded to the square or worn edge of the blade with an all-purpose steel electrode, such as an AWS 6012 or 6013. To prevent wear on the weld, this bead is then covered with a thin layer of hard-surfacing electrode. The same material is also used around the ends or corner castings, where the most severe wear takes place. This work-hardening steel edge is said to prolong the life of the blade many months, thereby effecting considerable savings in the cost of blade replacements.

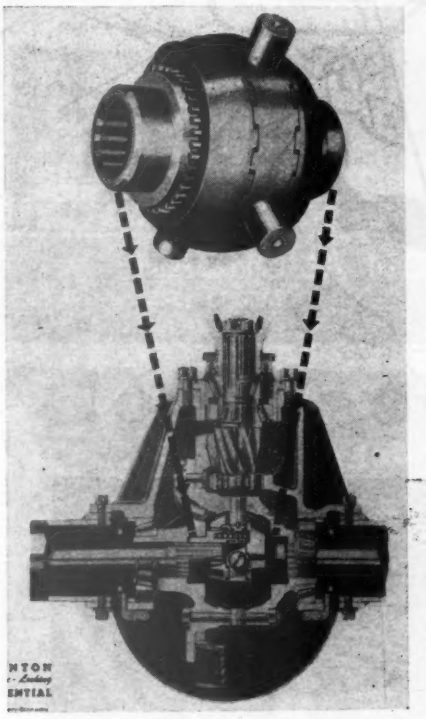
Where blades wear down fast, there is always the danger of ruining the moldboard if the operator does not watch it closely. With Allied's Nu-Edge this danger is minimized.

The accompanying illustration shows how this material is used in a dual role, for repairing grouser bars on track shoes and for rebuilding bulldozer blades.

• Differential Series

The Detroit Automotive Products Corporation (formerly the Thornton Tandem Company) is now supplying its distributors with 28 models of its "No Spin" differential in four basic sizes, series "C," "G," "J" and the new "E."

Available at this time is the new series "E' NoSPIN differentials for two-speed axles of the Eaton 1350 series. These differentials can now be installed in the two-speed axles of such popular trucks as the Ford 2-ton, Dodge WFA and WHA, Fargo FKA4 and FKA6, International KS5 and KS6, Federal 15K and 18K,



Stops wheel spin.

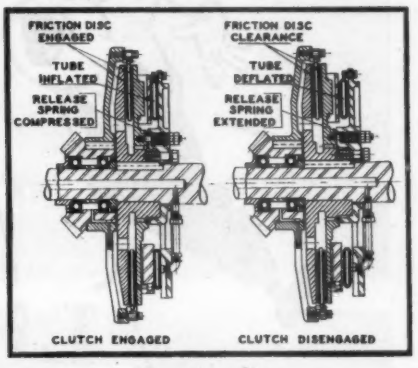
GMC models EC and EF, series 300 and 350, Diamond T models 404, 409, 409SC, R-950, and Canadian Chevrolet Maple Leaf.

Latest additional models being released this month include the series "J" No-SPIN differentials for several popular truck models including: Dodge WF and WH, and Fargo FK4, and FK6 trucks all equipped with single-speed axles, and Chevrolet 2-ton trucks having two-speed axles.

• Clutch

All Osgood excavators of one-yard capacity and over have been adapted to use the Osgood "Air-Cushion Clutch" for every operation except the main engine clutch.

This clutch, developed by the Osgood Company of Marion, O., is of the disc type and is engaged by admitting air to a circular rubber tube confined between



Uses air cushion.

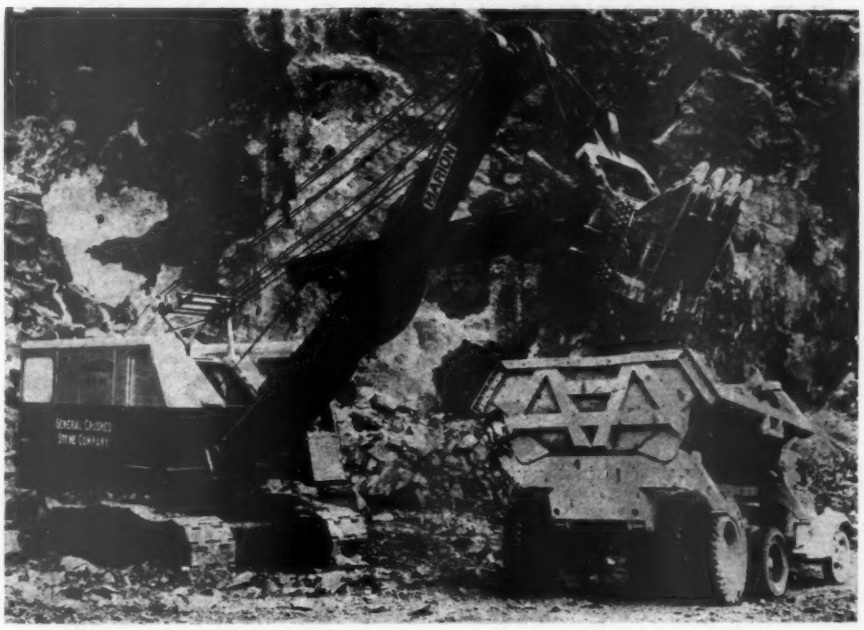
two plates, one of which is movable. When the air is admitted under pressure, the tube expands and causes the floating plate to clamp the friction disc between the floating plate and the back plate of the clutch. By means of metering valves the pressure can be varied, and the load can be picked up as slowly or as quickly as desired; yet, due to the volume of air required, it is impossible for the operator to admit air fast enough to cause the machine to jerk.

• All-Purpose Shovel

The Marion Power Shovel Company of Marion, O., presents the MARION 93-M, a 2½-cu.-yd. heavy-duty, all-purpose shovel, dragline, clamshell and crane, designed for mining, quarrying and large-scale construction projects.

The shovel front-end equipment includes an all-welded, rounded-edge, box-section boom, twin welded full box-section dipper handles and a heavy duty manganese-steel-front dipper with inserted, socket-type dipper teeth.

Varying boom lengths and bucket combinations available as job conditions require.



Live Wire!

SECO VIBRATING SCREENS

The top illustration may seem a little exaggerated, but there's no exaggeration in the statement that "dead areas" just can't exist on the screening surface of a Seco. No wonder then, operators everywhere (live wires themselves) choose Seco vibrating screens for screening more tons per hour . . . every hour . . . month after month . . . year after year . . . with little or no maintenance. Investigate Seco advantages today. Write for "A Guide to Better Screening." Dept. A.

TRUE CIRCULAR MOTION VIBRATING SCREENS

SECO

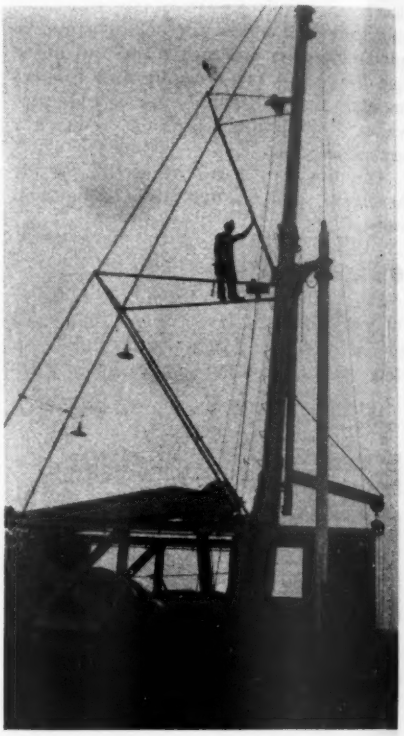
SCREEN EQUIPMENT COMPANY, INC.

9 Lafayette Avenue, Buffalo 13, New York

In Canada: United Steel Corp., Ltd., Toronto

● Stem Guide

The John Kahrs Company, 428 First Street, Wausau, Wis., is manufacturing a sliding stem guide which can be attached to any drilling mast. The unit weighs approximately 350 pounds and

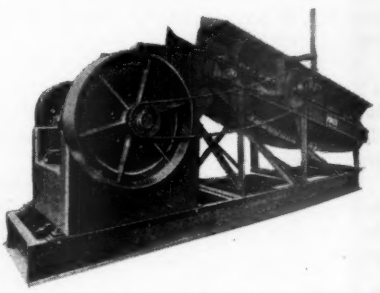


● Prevents whipping action.

can be installed in the field. The tracks are bolted to the mast, parallel to the line of motion of the well drill stem, so that the bell can be lowered along this track as the stem moves into the hole. It is claimed that this sliding guide will eliminate the whipping action of the drill stem.

● Apron Feeder

A new development in apron feeders is offered by Pioneer Engineering Works. Built around a unit assembly without sideboards, the feeder also can be furnished either with vertical or with flared



● Feeder with 9 combinations.

sideboards, thus making three models available. Each of these models can be furnished for any one of three drives: for gear motor, for conveyor drive, or for drive from the crusher. This provides nine combinations of the feeder, which can be secured in five lengths from 6 feet to 14 feet and in four widths from 30 inches to 48 inches.

This is a heavy-duty feeder. The pans are ½-in. forged steel plate, formed to overlap, for greater strength and rigidity. These overlapping pans, together with the side-boards, provide a continuous path for the materials, thus reducing spillage and slippage.

Interlocking malleable castings, bolted to the pan ends, form a continuous wall along each edge of the feeder bed. The pans are carried on heavy chains, which in turn are supported on large idler rollers so spaced that heavy impact and shock can cause no damage. The end shafts are of large diameter to give ample bearing surface.

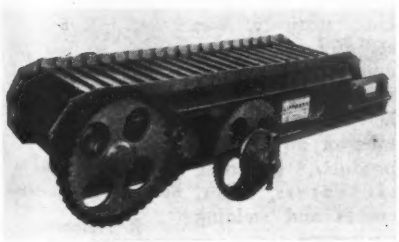
● Bulldozer

The Baker Manufacturing Company of Springfield, Ill., announces bulldozers and gradebuilders developed specially for the new Allis-Chalmers two-cycle, diesel-powered HD-5.

Dozer matches tractor.

Starting from tractor blueprints, Baker 'dozers were designed to match HD-5 tractor power, size and speed, built to maintain tractor balance, stability and traction, and mounted to cut maintenance costs.

The HD-5 is a small tractor with big tractor design, featuring a drawbar pull of 37.4 h.p., with five speeds from 1.46 to 5.47 m.p.h., 1000 hour roller and idler lubrication, full visibility for the operator, and simplified maintenance.



This new heavy-duty rock feeder made by the Lippman Engineering Works, 4603 Mitchell St., Milwaukee 14, Wis., is designed for heavy work and long distance conveying. It is composed of a series of cast steel plates made to hinge together in an endless length. Alloy steel pins connect each pan to the next to form one interlocking unit.

Portable aggregate plants are here to stay. If you are interested, the Pit and Quarry Handbook will tell you all about them.

Before You Rebabbitt . . .
It will pay you to send for and read the MAGNOLIA BEARING METAL Bulletin. It contains valuable information on how to get the best results when you use MAGNOLIA ANTI-FRICTION BEARING METAL or the other special purpose Bearing Metals.
Ask your dealer or send to us direct for your copy.

MAGNOLIA BEARING METALS

Look for the Flower Trade Mark

MAGNOLIA METAL COMPANY
24 WEST JERSEY STREET ELIZABETH 4, N. J.
Warehouses in Ft. Worth, Chicago, San Francisco and Montreal

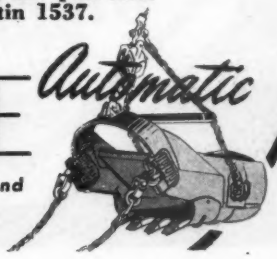
How to get full return on . . .
BIG DRAGLINE INVESTMENTS

Maximum returns on big dragline investments are dependent upon getting the best bucket available and using it correctly.

Page Automatics dig right in at the first pull on the load line because they always land in digging position and hold it even with all lines slack. Instant penetration at any depth, 20 feet to 100 feet — or more, assures full loads in any kind of digging in less than two bucket lengths. Perfect balance of the bucket helps the digging action. Teeth cannot be lifted off the ground by the pull line. For details send for Bulletin 1537.

New Page Reversible Center Shank Tooth Points secured by a hook bolt will stay absolutely tight.

PAGE Automatic



DRAGLINE BUCKETS and WALKING DRAGLINES

PAGE ENGINEERING CO., CHICAGO 38, ILLINOIS

TRADE NOTES

R. Bernhard

Richard Bernhard, chief engineer of the Traylor Engineering and Manufacturing Company of Allentown, Pa., since 1917, died on February 2. He was 73 years of age.

Mr. Bernhard was rated one of the most able men in the field of mining engineering, abroad as well as throughout the United States.

George W. Kelsey, a director and general sales manager of Builders Iron Foundry, Providence, R. I., has been named a vice-president of that concern. Mr. Kelsey is also an executive of three Builders Iron Foundry subsidiaries—Builders-Providence, Inc., and Omega Machine Company, both of Providence, and Builders-Pacific, Inc., Berkeley and Huntington Park, Calif.

C.I.T. Corporation announces the opening of new regional offices in Atlanta, Ga., at 66 Luckie Street, N.W. E. H. Mayer is in charge of the office.

Link-Belt Company, Pacific Division, Seattle, Wash., manufacturers of conveying and power transmission machinery, announce the completion of their newly-built plant at the corner of Sixth Avenue, South, and Hinds Street in Seattle.

Fred A. Koepf, district manager, and Harvey V. Eastling, manager of engineering sales, direct the company's activities in the Pacific-Northwest area from their headquarters in the new Seattle building.

• The new plant built by Link-Belt Company at Seattle, Wash.

• Officers and directors of the Associated Equipment Distributors, named at the 28th annual convention in Chicago on February 15. Front row, left to right: H. L. Burleson, vice-president and director of Region 10; W. A. Danner, president and director of Region 1; A. F. Garlinghouse, executive vice-president and director of Region 11; C. F. Halladay, vice-president and director of Region 8.

Second row, left to right: M. J. Lyons, director of Region 13; E. M. Farnum, treasurer; C. F. Winchester, executive secretary; H. J. Hush, director of Region 2; F. M. Viles, director of Region 12.

Third row, left to right: J. W. Bell, director of Region 9; J. W. Wilson, director of Region 6; E. J. Crosby, director of Region 1; G. W. Swart, director of Region 7; R. L. Arnold, director of Region 14.

As of February 27, 1947, the Bath Iron Works Corporation, of Bath, Me., has purchased all the outstanding stock of the Pennsylvania Crusher Company of Philadelphia.

The Pennsylvania Crusher Company is one of the oldest concerns in the crusher business and has been responsible for many of the innovations that have taken place in crushing and pulverizing products in the cement, gypsum, chemical, and lime industries throughout the world.

The Pennsylvania Crusher Company had no plant of its own, having heretofore sub-contracted its production. Arrangements will be made to concentrate all manufacturing at the Bath plant, where facilities are well adapted to handle this type of heavy construction. Sales and engineering offices will continue to be at Broad and Arch Streets.

The engineering personnel of the Pennsylvania Crusher Company will remain with the company.

The following officers and directors have been elected. W. S. Newell, president; J. Wm. Schulze, vice-president and treasurer; A. H. Kretschmer, secretary and assistant treasurer; S. D. Hartshorn, acting general manager.

At their own request, G. W. Borton, former president and general manager, and W. A. Battey, former vice-president, have retired, but will continue to act as directors.

R. Holcomb

Ralph D. Holcomb, who has been district manager for Harnischfeger Corporation's San Francisco territory, was recently made general sales manager. In his new position he will direct the sales of all P & H products, including excavators, hoists, cranes and welding equipment.

Mr. Holcomb has directed sales activities in several sections of the United States. He has been with the company for the last 18 years.

The Yale & Towne Manufacturing Company has announced plans for a new plant in Philadelphia which will have more than 600,000 square feet of floor space. Hoists, hand lift-trucks, electric trucks, cranes and similar equipment now manufactured by the Materials Handling Division plant in Philadelphia, will be produced in the new factory.

Legal Decisions

By LEO T. PARKER
Attorney at Law

Weather Warnings

All persons, corporations and firms are bound, so to speak, to prepare for emergencies indicated by United States weather report.

For illustration, in *Seaboard Sand & Gravel Corporation v. Elmhurst Contracting Company, Inc.*, 68 Fed. Supp. 169, reported January, 1946, the testimony proved facts, as follows: The Seaboard Sand & Gravel Corporation chartered its deck scow to the Elmhurst Contracting Company. The scow was returned in damaged condition and the gravel company sued the contracting company for damages.

During the trial testimony was given that the scow was damaged during the night because of a northeast wind which attained the "unpredicted velocity of hurricane force."

The contracting company contended that it was not liable because, while it had had storm warnings, it had no cause to anticipate a storm of such violence.

In holding the contracting company liable the higher court said:

"If the contracting company is to escape liability on the theory of inevitable accident, then surely it must establish by convincing proof that the disaster was brought about by causes beyond the control of anyone. This it has not done in this case. . . . The respondent had notice of severe weather to come, and I believe the precautions it took were inadequate."

Not a Process

Many state laws specifically *exempt* from taxation *all* employment used in the production of merchandise by "processing." Modern higher courts consistently hold that the word "process" means to subject material as sand and gravel to a process of manufacturing, development, or preparation for the market. Thus neither a sale nor use tax need be paid on equipment used to convert into marketable form livestock by slaughtering, grain by milling, sand and crushed rock by screening, milk by pasteurizing, and vegetables by sorting and repacking, etc., etc.

For example, see *Huron-Fish Company v. Glander*, 67 N. E. (2d) 546, reported August, 1946, where a higher court upheld the validity of a state law which provides that no "use" or "sales" tax shall be collected on merchandise which the purchaser uses for the production of merchandise by "processing."

Broad Damages

Generally speaking, a damage judgment against a negligent truck driver employed by a seller of nonmetallic materials may include *all* damages sustained by the injured party.

For illustration, in *Kentucky Company v. Campbell*, 186 S. W. (2d) 409, it was shown that a driver named Campbell was driving his truck to which was attached a 23-foot trailer. A truck and 20-foot trailer owned by a corporation was being operated on the left side of the highway collided with Campbell's truck. Campbell sued for heavy damages.

The higher court held that Campbell was entitled to recover an amount of damages from the corporation including his personal injuries, the loss of use of the truck and trailer, cost of repairs, and permanent injury to the truck and trailer.

Totally Blind

Considerable discussion has arisen from time to time over the legal question: If an employee who had previous disability sustains an injury resulting in total and permanent disability, can he recover compensation based on total disability? Also, can a clerk recover compensation for an accidental injury?

For example, in *Special Indemnity Fund* v. *Sims*, 163 Pac. (2d) 210, it was shown that one Sims sustained an accidental injury in the course of employment. The employee's first notice of injury gave as cause of accident, "Struck head against protruding metal bar" and in describing nature and extent of injury stated: "Complete blindness—left eye. Previously blind in right eye."

The evidence showed that the employee received a blow to his left temple and developed severe headaches and dizziness and trouble with his left eye. He received medical treatment and hos-

TOP PERFORMANCE
FROM THIS BELT
Big Tonnage -- Long service -- Low belt cost per ton
and the name CINCINNATI are synonymous . . . .
where you find a Cincinnati belt in operation you're sure
to find outstanding performance. Buy CINCINNATI
for the best in conveyor belting.
THE CINCINNATI RUBBER MFG. CO.
Cincinnati 12, Ohio
CINCINNATI
RUBBER
MANUFACTURING CO.
CINCINNATI, OHIO
CONVEYOR
BELTS

pitalization and several operations in an effort to preserve the sight of the left eye over a period of several months, but the eye grew progressively worse and the vision was completely gone. That the loss of vision to the left eye was the result of the accident was not questioned by the employer. However, compensation, under the State's Workmen's Compensation Act, was refused on the grounds that the employment and duties of Sims were exclusively clerical, and, therefore not "hazardous," which barred payment of compensation for injuries received when he struck his head on a metal bar. However, since Sims was employed only primarily as a stock room clerk, and his duties consisted largely in placing and handling stocks of supplies, the higher court awarded compensation.

Another important point of law decided by this court was that although Sims became totally blind and permanently disabled, as a result of the accident, the court ordered the employer to pay compensation based for loss of *one eye only* and for temporary disability.

Rock Mined Illegally

Considerable discussion has arisen from time to time over the legal question: If one mines rock or other non-metallic materials from land of another, what amount of damages can the land owner recover from the trespasser?

For example, in *Connoley* v. *Beyer Crushed Rock Company,* 197 S. W. (2d) 653, reported February, 1947, a land owner sued the Beyer Crushed Rock Company to recover damages for rock removed from the land without permission of the land owner. The Beyer Crushed Rock Company had improperly measured the distance, or failed to have a survey and did not purposely and intentionally remove the rock. The Beyer Crushed Rock Company admitted removing 36,588 tons of rock from the premises without any legal right but stated that this was not wilfully done. The lower court estimated the amount of damages for $5,256.44. The Beyer Crushed Rock Company appealed to the higher court and proved that the reasonable difference between the market value of the land before and after the removal of the rock was $3,000. Therefore, the higher court reduced the damage verdict to $3,000. This court said:

"The reasonable market value was the price which the unmined rock would bring when offered for sale by one who was willing, but not obliged to sell it, and bought by one who was willing to purchase, but not compelled to do so."

Officers Personally Liable

Modern higher courts consistently hold that a corporation's officers are liable to other stockholders for losses caused by negligence or wilful misconduct.

For illustration, in *Kirchdorfer* v. *Liberty,* 197 S. W. (2d) 608, it was shown that a corporation was organized under the name of Falls City Quarry Company, with a capital stock of $15,000. The corporation manufactured crushed rock used in the construction and repair of state highways.

In subsequent litigation it was charged that certain officers of the corporation had converted to their own use all of the profits earned by the corporation. The higher court held that where the directors or officers of a corporation are guilty of a breach or neglect of duty, the officers or directors are personally liable to the corporation.

Install Reflectors

An unfortunate accident occurred when the light fuse on a truck suddenly blew out, leaving the truck without lights. The driver moved the truck over to the edge of the pavement and was getting out his pot torches when a passenger car crashed into the truck. The occupant of the passenger car sued the truck owner on the grounds that the truck driver was negligent in failing to use rear reflectors.

The higher court held that the truck owner would be liable if the testimony proved that the driver could have avoided the collision by the use of reflectors on the rear of the truck.

Fellow Employee Rule

Under ordinary circumstances an employer is not liable in damages for injuries inflicted on an employee by a fellow employee. But the employer is liable if he or his superintendent knew that a fellow employee was doing dangerous things and failed to correct it.

For illustration, in *Coughlin v. Arms Textile Company,* 46 Atl. (2d) 130, reported 1946, the testimony proved that an employee, Robert, had been in the habit of throwing rocks and other objects. An employee named Coughlin complained to the superintendent, who promised to stop this dangerous practice. A few days later Robert threw an object and struck Coughlin, inflicting serious injuries.

Coughlin sued the company to recover damages for the injury. The counsel for the company contended that Coughlin could not recover damages for the injury because it was inflicted by a fellow employee. However, the higher court held in favor of Coughlin, saying:

"The contention of the defendant (company) that the plaintiff (Coughlin) assumed the risk is unsound . . . Obviously the fellow-servant rule has no application to a case like the present where the defendant (employer) *has knowledge* of the dangerous propensities of the servant which caused the injuries."

New Higher Court Decisions Affecting Non-metallic Industry

A few days ago a reader wrote, in part, as follows: "Last week a government agent came into our plant and inspected our books. He ordered us to pay back wages to all of our employees for the past two years. This means a lot of money to us. Our employees are satisfied, but this agent states that we must pay wages specified by the Fair Labor Standards Act because we sell sand and gravel to railroads who do in-

FLEXIBILITY
plus UNIFORM REDUCTION
AMERICAN HAMMERMILLS

- Quickly and easily adjusted externally from roadstone to agstone for seasonal requirements.
- High tonnage output without slivers and finger stones—a consistent cubical product.
- Custom built to your requirements — 5 to 250 TPH.

Americans' sectional construction permits easy dismantling and relocation to follow the operation. Note compactness for minimum headroom requirements.

No matter how difficult your crushing problems—or how varied your crushing requirements—the wide range of reduction and the flexibility of American Hammermills will prove highly efficient in a one-step or closed circuit operation. Custom-built to suit the particular stone and operating conditions in your quarry.

Send for New Bulletin "Better Stone Crushing."

American PULVERIZER COMPANY
Originators and Manufacturers of Ring Crushers and Pulverizers
1059 Macklind Ave.
St. Louis 10, Mo.

terstate business. We thought we were not subject to this law, since we do not ship materials outside the state. Please advise us."

For several years, in these pages, we have rendered the law that all sellers are subject to the Fair Labor Standards Act although they sell materials to purchasers within the state if *the latter* use the materials in interstate commerce. Hence this reader must pay back wages based on time and one-half for all overtime, plus heavy penalties. This is the law as laid down by the Supreme Court of the United States.

See *Walling* v. *Pueblo Sand and Gravel Company,* 153 Fed. (2d) 159, reported 1946. Here it was shown that the Pueblo Sand Company sells cast shed sand to the Colorado Fuel and Iron Corporation, which manufactures railroad rails, construction beams, castings, wire, and numerous other iron and steel commodities sold in interstate commerce.

The higher court held that the Pueblo Sand and Gravel Company must pay its employees wages specified by the Fair Labor Standards Act, although it shipped *no* merchandise in interstate commerce. This court said:

"The work of such employees is intimately related to the actual physical process by which the steel goods are manufactured."

Thus, all employees must be paid wages specified by the Fair Labor Standards Act who do work "necessary" to the production of goods shipped in interstate commerce.

When Basic Rule Is Valid

On the other hand, according to a late higher court decision, a contract by which employees are paid on the basis of a "basic" rate does not violate the Fair Labor Standards Act.

For example, in *Walling* v. *Halliburton Cementing Company,* 152 Fed. Rep. (2d) 622, the testimony showed that an employer made contracts with his employees in writing by which the employees agreed to work for a basic rate of 59 cents per hour for the first 40 hours of any work week, plus one and one-half for all overtime. Also, the employer guaranteed that each employee should receive *not less than* $63.46 for each work week.

The higher court held this employment contract valid and not a contract merely fixing weekly minimum payments to evade provisions of the Fair Labor Standards Act. This is so because the wages were not below the minimum specified by this Act.

On the other hand, see *Watkins* v. *Hudson Company,* 151 Fed. Rep. (2d) 311. This higher court held that all wage contracts which maintain wages below the minimum specified by the Fair Labor Standards Act are illegal.

Must Prove Employment

Modern higher courts consistently hold that no employee may recover either compensation or damages for an injury if he fails to prove that his injury was sustained within the scope of the employment.

For illustration, in *Wegley* v. *Snyder Sand and Gravel Company,* 70 N. E.

Investigate

this MODERN Core-Drilling Machine

It's Engineered to Meet Your Most Severe Demands

Sprague & Henwood Core Drilling Machines are modern in every respect . . . can EASILY perform the work expected of them! That's because they are built to meet the demands of present day core drilling work! The machines are high speed, exceptionally sturdy constructed to withstand rugged service. Available with two distinct types of feeds, "Screwfeed" and "Hydraulic," according to the type of swivel head selected. Have many exclusive features. Write today for full details.

Bortz DIAMOND BITS are also manufactured by Sprague & Henwood. Full details sent upon request.

SPRAGUE & HENWOOD, Inc.
Dept. K SCRANTON, PA., U. S. A.

SCHIELD BANTAM TRUCK-MOUNTED SHOVEL
Interchangeable
DRAGLINE — CLAM — TRENCH HOE

Here, for the first time is a small shovel with the mobility of a truck and the rugged performance of big equipment. Ideal for loading stockpiled materials. Works the inaccessible corners where larger equipment cannot be set up.
The BANTAM is the complete answer to many operators' problems, with its many attachments and fast operation, bringing fine reports from present users, many of whom have profitably enlarged their operations, adding their second and third units.

Write for details to:

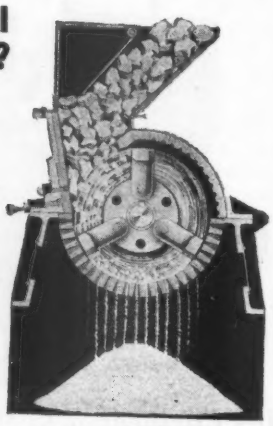
SCHIELD BANTAM CO., INC.
WAVERLY IOWA

45,000,000 TONS of LIMESTONE

What part of this tonnage will your plant produce in 1947?

Gruendler Crushers are now producing over six million tons of Limestone annually.

And NOW with the many orders filled and other orders in our plant for more Gruendler Crushers scheduled for prompt shipment, an additional million tons of crushed Agriculture Limestone will be credited to GRUENDLER.



Cut-a-way view of Gruendler Pulverizer

If you are thinking of increasing your production of Ag-stone, we suggest you place your order Now for Additional Gruendler Equipment.

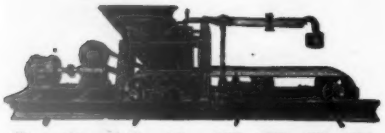
GRUENDLER CRUSHERS are known for their sturdy construction and dependability—Over 63 years your standard for comparison. *GRUENDLER IS DELIVERING!*

WRITE OR WIRE FOR DATA or BULLETINS

GRUENDLER

CRUSHER and PULVERIZER CO., ST. LOUIS 6, MO.

R for "stepping up" Production



WEIGHING

SCHAFFER POIDOMETERS

BLENDING

FEEDING

PROPORTIONING

It's easier climbing to top capacity and profit figures if the weighing of your raw and finished materials is expedited by SCHAFFER Poidometers.

These machines provide a fast, accurate and automatic record of weights. They blend materials according to predetermined standards, and insure high product unifermity.

Poidometers are finely engineered and built, operating on a minimum power and upkeep basis.

Write for Catalog No. 5

SCHAFFER POIDOMETER CO., 2828 Smallman Ave., Pittsburgh 22, Pa.

(2d) 486, reported February, 1947, it was shown that the Snyder Sand and Gravel Company had complied with the Workmens Compensation Laws with reference to the sand and gravel business. An employee of the sand and gravel company was killed in an adjoining gasoline filling station. His dependents sued the sand and gravel company for damages but failed to prove that the employee was acting within the scope of his employment at the filling station. Therefore, the higher court refused to allow the dependents any damages.

Employer Must Prove Case

Generally speaking, an employee cannot recover damages from his employer for an injury if the former fails to prove that the injury resulted from the employer's negligence. But the rule of law is different if the employer declined to contribute to the State Workmen's Compensation fund.

In *Buhler* v. *Maddison,* 176 Pac. (2d) 118, reported March, 1947, it was shown that an employer did not seek protection under the State Workmen's Compensation Act. An employee sustained severe injuries as result of a delayed blast of a dynamite charge. The trial court directed a verdict in favor of the employer for $16,398.70.

The higher court approved the verdict and said that the presumption of negligence of an employer who declines to come within a state compensation act cannot be overlooked or denied.

In other words, the employer was held liable in damages because he failed to prove that the employee's own negligence resulted in the injury.

Fixtures Belong to Building

Considerable discussion has arisen from time to time over the legal question: "When a mortgaged building is sold to satisfy payment of a mortgage, who owns the fixtures?"

In *Fuson* v. *Whitaker Company,* 190 S. W. (2d) 305, it was shown that modern wall cases were installed in a building. These wall cases were *not* attached to the building.

The higher court held that a seller who held a mortgage on the fixtures could *not* remove them. This court held that wall cases are "legal fixtures" and belong to the owner of the building.

Cannot Foreclose

It is well for dealers who give mortgages to secure loans to know that if the mortgage contract is not *substantially* breached, the court will not approve foreclosure proceedings.

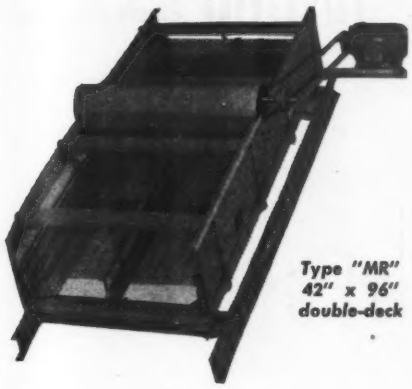
For example, in *Arco Company* v. *Hawthorne, Inc.,* 43 Atl. (2d) 693, it was shown that the holder of a mortgage sued for foreclosure for default in the payment of the agreed 3 percent interest on the debt by the mortgagor. During the trial the testimony showed that the latter had been paying a tax rate of $4.23 per $100 on the mortgage. Therefore, the higher court refused to allow foreclosure of the mortgage, saying:

"It is, therefore, obvious that as long as the tax rate is higher than the interest rate, the mortgagor, upon payment of the taxes, will not be required to pay any interest on the mortgage."

"Installing a UNIVERSAL"

means

Employing the Vibrating Screen with 28 years of specialized experience behind it.



Type "MR" 42" x 96" double-deck

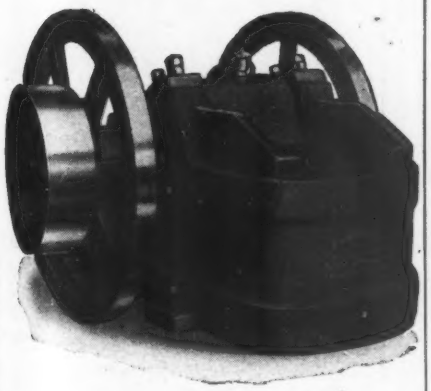
Universal offers a wide variety of light & heavy duty models to best fit your particular requirements.

Send for 32 page Catalog No. 107 on Screens and Screening.

UNIVERSAL VIBRATING SCREEN CO.
RACINE - - WISCONSIN

FARREL BACON CRUSHERS

Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants. Engineering Service.



FARREL-BACON
ANSONIA, CONNECTICUT

Arbitration

Contracts are valid which require contracting parties to "arbitrate" rather than settle a legal controversy in the courts, provided that *both* parties comply in detail with the agreement to arbitrate.

See *Los Angeles Company* v. *Friedman,* 165 Pac. (2d) 728.

Must Be Printed on Stock Certificate

According to a recent higher court stockholders of a sand and gravel corporation are not bound by provisions of the by-law regarding sale of stock if such provision is *not* printed on the stock certificates, in accordance with valid laws.

For example, in *Weber* v. *Lane,* 24 N. W. (2d) 418, reported January, 1947, the testimony showed that friction had arisen between majority and minority shareholder interests. Litigation resulted. During the trial it was shown that a by-law of the corporation required a shareholder, before selling his stock, first to offer it to the corporation or another shareholder.

The higher court held that this by-law did *not* preclude the sale of assets of the corporation to a nonshareholder where the by-law restrictions were *not* printed upon the certificates of the stock.

TRAFFIC News Digest

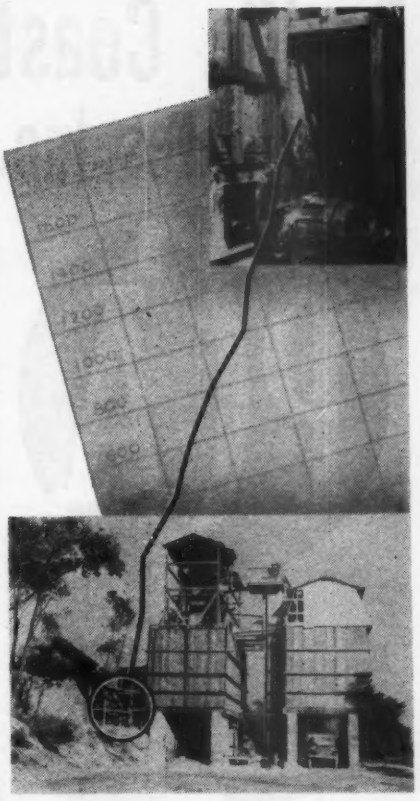
CENTRAL FREIGHT ASSN. DOCKET

Docket 82672 (2) — Slag, crushed or crushed commercial (other than granulated), in open-top cars, carload minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply. Establish on, from Ashland, Ky., and Jackson, O., to Salem, Ind., 204 cents net ton, subject to Ex Parte 162 increase.

Docket 82674 (2)—Sand, all kinds, and gravel, in open-top cars, carload minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply. Establish on, from Columbus, O., to Lorain, O., 138 cents net ton, subject to Ex Parte increase.

Docket 82675 (1) — Crushed stone, in bulk, in open-top cars, carload minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply. Establish on, from Piqua, O., to Bremen, Ind., 149 cents net ton, subject to Ex Parte 162 increase.

Docket 82757 (2)—Lime, common, hydrated, quick or slaked, also agricultural and fluxing, carload minimum weight 30,000 pounds and 50,000 pounds. Establish on, from Speed, Ind., to destinations in Central Freight Association territory, rates on basis reflecting the I. C. C. docket 16170 Scale, increased 10 percent under Ex Parte 123 for the 30,000 pounds, minimum weight and 80 percent thereof for the 50,000 pounds, minimum, subject to Ex Parte 162 increase.



TOPS IN TONNAGE

WITH DUAL IMPACT ACTION ! ! !

Six sizes of aggregate (screenings, ¼", ½", 1", 2", and ballast) from one fast pass through the Model 3030 Double Impeller Breaker. That's the daily production habit at the Wenger and Sensenig Quarry, Paradise, Pa. All sizes of cubical aggregate from run-of-quarry stone . . . reduced by one hard-hitting, two-fisted breaker.

Selected sizes for specification orders are produced by the same Double Impeller Breaker. Simply vary impeller speeds and adjust breaker bars. You get any size from ag lime to road ballast. Versatile . . . Dependable.

Write Dept. U-3 today for full details.

New Holland Manufacturing Company
Mountville, Pennsylvania

NEW HOLLAND
DOUBLE IMPELLER BREAKER

Pacific Coast Aggregates, Inc.

Announces

THE COMPLETION OF

"Headquarters for Quality Building Materials at Sensible Prices"

400 ALABAMA STREET • SAN FRANCISCO

We dedicate this handsome, modern building—and 48 other PCA plants, offices and warehouses—to the goal of helping Northern California to meet its critical housing and construction needs.

It is our established PCA policy to manufacture and distribute all types of building materials in the largest possible volume at the smallest possible mark-up. That's why "PCA" is always the symbol of TOP VALUE IN BUILDING MATERIALS.

PCA Pacific Coast Aggregates, Inc.

CONTACT THE NEAREST PCA OFFICE BELOW

SAN FRANCISCO
400 Alabama Street
KLondike 2-1616

OAKLAND
2400 Peralta Street
HIgate 0770

FRESNO
414 P Street
Ph. 4-3065

SACRAMENTO
16th & A Streets
Ph. 3-6586

STOCKTON
1020 E. Main Street
Ph. 8-8643

SAN JOSE
790 Stockton Avenue
BAllard 8670

Docket 82813 (2)—Limestone, ground or pulverized, unburned, carload minimum weight 60,000 pounds. Establish on, from Lamson, Michigan to representative points in the Lower Peninsula of Michigan, rates as shown in Exhibit D:

Exhibit D
Rates in cents per ton of 2000 pounds, subject to Ex Parte 162 increase

	per ton
Proposed rate to Michigan (representative)	
Hartford, Sturgis, Eaton Rapids, Charlotte	$2.04
New Buffalo, Port Austin, Niles.	2.15
Port Huron, Sandusky, Coldwater, Cement City, Ypsilanti.	2.20
Port Hope	2.26
Bad Axe, Pigeon, Three Rivers..	2.09
Vicksburg	1.93

ILLINOIS FREIGHT ASSOCIATION DOCKET

Docket Irc 511-571—Stone, crushed, coated with asphaltum, oil or tar, carload from Krause, Ill., to Irving, Ill.; present—class or combination; proposed—$1.65 net ton. From Krause, Ill., to Pana, Ill.; present—class or combination; proposed—$1.78 net ton. From Krause, Ill., to Windsor, Ill.; present—class or combination: proposed $1.90 net ton (subject to X-162 increase).

SOUTHWESTERN FREIGHT BUREAU DOCKET

Docket 41439 (2)—Limestone, limedale spur, Ark., Mosher and Ste. Genevieve, Mo., to Memphis, Tenn., Natchez and Vicksburg, Miss. To amend item 820 of Southwestern Lines tariff 162-T, so that rates will also apply in cars other than in box cars.

TRANSCONTINENTAL FREIGHT BUREAU APPLICATIONS

Docket 891 (shipper)—Lime from Sallisaw, Okla., to Clifton, Ariz.: Request to amend item 2440, tariff 1, by adding Sallisaw, Okla., as a point of origin subject to same 37 cents per 100 pounds as applies from Houston and Dittlinger, Tex., subject to Ex Parte 162 increases.

TRUNK LINE ASSOCIATION DOCKET

Docket 44037 (shipper)—Stone, fluxing, furnace or foundry, melting or refractory (unburned), in bulk, in open-top cars, carload, minimum weight 90 percent of marked capacity of car, etc., from Snow Flake, W. Va., to New Boston, O., $1.30 per gross ton, (subject to Ex Parte 162 increase), in lieu of current sixth class rate of 24 cents per 100 pounds. Reason: Comparable with rates applying from and to other points.

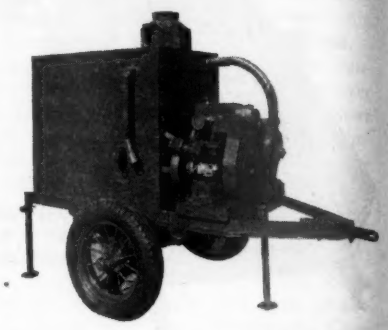
WESTERN TRUNK LINE NEW APPLICATIONS

Docket E-41-834—Sand and gravel as described in Item 25, Columns A, C, and D, Western Trunk Line tariff No. 41-A, from Muscatine, Ia., to Ashland, Ky., and Struthers, O.; proposed—363 cents net ton.

SPRAGUE & HENWOOD CORE DRILLS AND EQUIPMENT. Catalog. 27 pages. Contains illustrated bulletins with detailed descriptions of numerous drilling devices and accessories. Especially featured: Sprague & Henwood Core Drilling Machine No. 40 (formerly No. 38), No. 138, No. 142; "Trucast" Bortz diamond bits; and Series "M" corebarrels. Sprague & Henwood, Inc., Scranton 2, Pa.

DRILL *without* DUST

KADCO EQUIPMENT Reduces Costs Eliminates Hazard



Use KADCO Dust Control equipment on your rock drills for greater drilling footage—less blacksmithing—longer tool life—better working conditions. Available in a wide range of sizes for all operations. For sale or lease.

Write for Information

KADCO CORPORATION
LONG ISLAND CITY, N. Y.

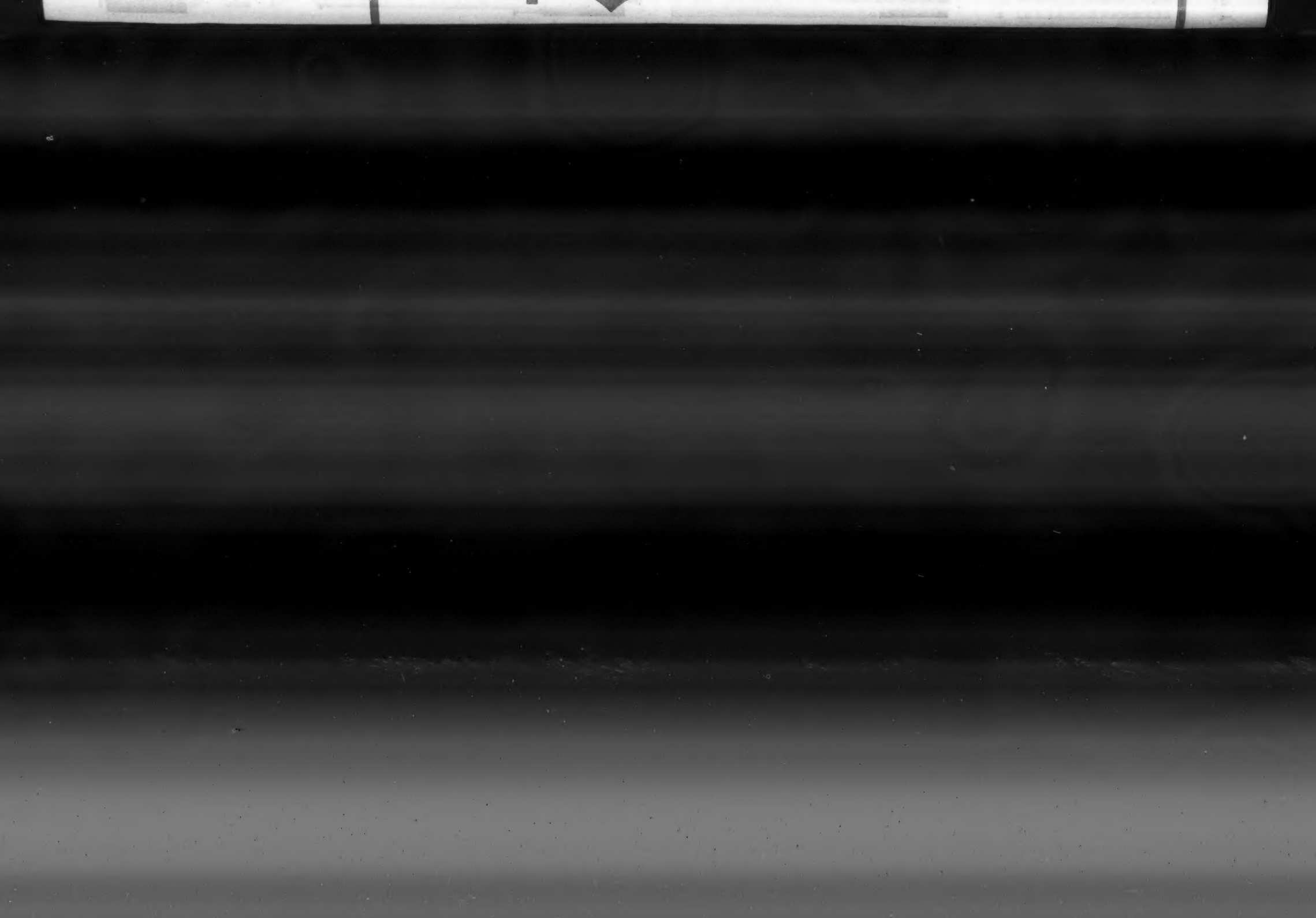
CORE DRILLS

EARTH SAMPLERS & AUGERS

Test the quality and extent of your sand—gravel—clay—kaolin—rock and mineral deposits easily and quickly by using Acker portable core drills and sampling tools.

Send for Bulletins

ACKER DRILL CO.
SCRANTON 3, PA.



PIT AND QUARRY

CONCRETE MANUFACTURER

Ace-high production ... 13,958,667 block!

This is the record of another Stearns Joltcrete, which, after more than six and one-half years of satisfactory operation, continues in high production. Deane R. Lynde of Cinder Concrete Products, Inc., of Denver and Kansas City, operating four No. 9 Joltcretes, supplies the following figures:

Between the time of its installation in April 1939 and December 30 of last year, this one machine produced 13,958,667 8x8x16-in. block or their equivalent.

Maintenance costs during these years; including replacement parts and labor, amounted to only 1/15 of a cent per block.

Many satisfied Joltcrete owners are sending us similar reports. You too can profit by the efficient, high production, low cost operation of one or more Stearns Joltcretes.

Ask any Stearns owner and get the facts. Write to us for a full description of this ace producer: Stearns Joltcrete No. 9.

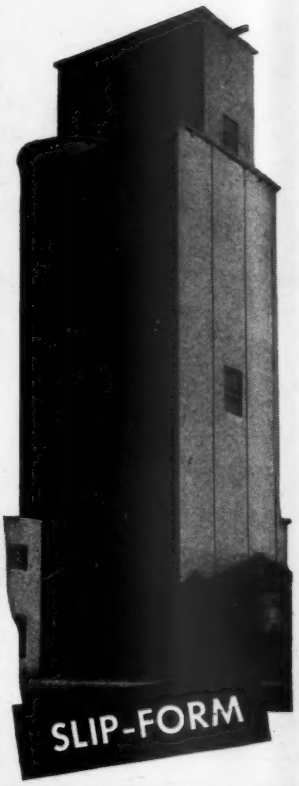
STEARNS

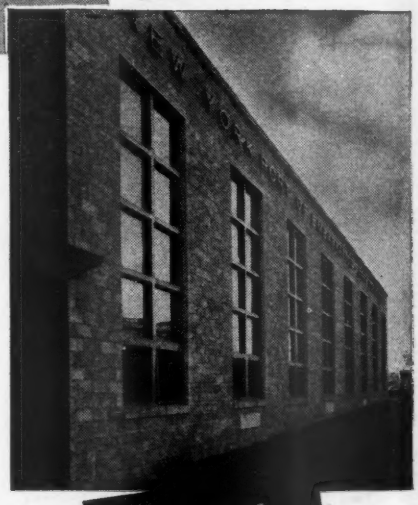
STEARNS MANUFACTURING CO. INC. • ADRIAN, MICH.

GENE OLSEN, PRESIDENT

Patents! Manufactured under Gelbman and other patents. Infringers will be prosecuted.

ADAPTABILITY TO CONCRETE CONSTRUCTION





Since its introduction eight years ago, Atlas Duraplastic air-entraining portland cement has proved its versatility—its adaptability to almost every type of concrete work. The pictures show a few of its varied uses.

Duraplastic cement makes the concrete more plastic, more uniform and more durable. Its use requires no unusual changes in methods — just the same good workmanship and careful supervision regularly employed. It complies with ASTM and Federal specifications and sells at the same price as regular cement.

Send for further information. *Write to Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.*

OFFICES: Albany, Birmingham, Boston, Chicago, Cleveland, Dayton, Des Moines, Duluth, Kansas City, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Waco.

PQ-D-46

ATLAS DURAPLASTIC

TRADE MARK REG. U. S. PAT. OFF.

AIR-ENTRAINING PORTLAND CEMENT

MAKES BETTER CONCRETE AT NO EXTRA COST

A UNIVERSAL ATLAS PRODUCT

"THE THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel—Sunday Evenings—ABC Network*

1947 Edition CONCRETE INDUSTRIES YEARBOOK

Ready for delivery
Limited number
Order — N O W !
Price — only $1.00

Yes, the big, new, completely rewritten 1947 Edition of the CONCRETE INDUSTRIES YEARBOOK—famous, up-to-the-minute encyclopedia handbook of the concrete industries—is now ready for immediate delivery.

Its 100 pages are profusely illustrated and literally filled with all kinds of down-to-earth, ready-to-use, practical facts, data, methods, procedures, suggestions, and ideas —actually a concise combination of the "know how" of the keenest brains in all phases of the concrete industries.

In simple, explicit, easy-to-understand language the 1947 Edition of the CONCRETE INDUSTRIES YEARBOOK will tell you—how to step-up production, how to lower costs, how to improve quality, how to increase profits, how to lay-out equipment for most efficient operation, how to solve tough production problems—and a host of similar, valuable facts. In addition, it will put at your finger tips—illustrations and descriptions of all the important types and makes of equipment.

Regardless of whether you've been in the concrete business for 30 years . . . or . . . plan to enter it tomorrow—it will certainly pay you and every key man in your organization to own a copy of the 1947 Edition of the CONCRETE INDUSTRIES YEARBOOK. Advance orders already indicate that the big, new, 1947 Edition will be sold out in a hurry.

Remember—there are only a limited number of copies. Better order right now and avoid disappointment. Price — only $1.00 a copy.

NEWS OF CONCRETE MANUFACTURERS

Texas Company Continues Waterproofing Experiments On Concrete at Boulder

The Texas Company has renewed its contract with the University of Colorado engineering experiment station at Boulder for research in waterproofing mortar and concrete, it was reported by Warren Raeder, head of the department of civil engineering at the university. The study is concerned with adding asphalt and related petroleum derivatives to concrete as a means of increasing water resistance and flexibility of the resulting concrete structures.

It has already been determined that the petroleum materials increase the amount of air that can be incorporated in the concrete mix, the engineering department reported. This entrained air increases the resistance of the concrete to freezing and thawing. William H. Thoman, professor of civil engineering at the university, is supervisor of the project.

Fortieth A.C.P.A. Convention To Be Held at New Orleans

An announcement from the American Concrete Pipe Association states that the next (40th) convention of that organization will be held at New Orleans. The date has not yet been announced, but it will be as soon as possible after the Mardi Gras, probably some time in March, 1948.

The summer meeting of the executive committee will be held in conjunction with a regional meeting at Yellowstone Park in July.

Wabash Valley R. M. Assn. Holds Convention in Chicago

The Wabash Valley Ready Mixed Concrete Association scheduled its fifth annual convention and ready-mixed concrete short course for April 10 and 11, to be held at the Stevens Hotel in Chicago.

Officials emphasized the importance of evaluating correctly the significance of the tremendous building boom and its effect upon the ready-mixed concrete industry.

Herbster Named President By Neff & Fry Directors

D. H. Herbster, who has been for the last ten years sale manager of The Neff & Fry Company, Camden, O., was recently elected president, succeeding C. Rodney Neff. Neff & Fry are makers of super-concrete stave farm silos and industrial storage bins and systems. Mr. Herbster has played an important role in the history of the firm.

Mr. Neff resigned from his position in order to devote more of his time to other interests; he will, however, assume

D. H. Herbster

the duties of the company's treasurer and will serve as a director on the board.

Concrete Industries Boom Produces New Canadian Plants

A $160,000 plant containing 20,000 square feet o' floor space is to be built in the immediate future at Chatham, Ont., Canada, by the Hadley-Moulthrop Engineering Company for the production of Vibrapac concrete block and other masonry units, as well as precast concrete products.

A second new industry in Chatham is the Central Block Manufacturing Company, which recently opened for business. Patrick Smith is manager. The firm plans to enlarge its plant as soon as its expanding business permits.

At Montreal the LaSalle Concrete Products, Regd., is erecting a plant in the Ville LaSalle section of the city. The cost of the new facilities is estimated at about $10,000.

Harold C. Boswell, vice-president of the Ready Mix Concrete Company of Sioux City, Iowa, died recently at the age of 49. He had been affiliated with L. G. Everist, Inc., of Sioux City for 26 years until January 1, 1946, when he resigned from his duties as secretary-treasurer of that firm.

California Block Maker Speeds Output by Using New Material Handler

Substantially increased production of concrete blocks has been achieved by The United Concrete Manufacturers plant at Roscoe, Calif. The speed-up was facilitated, says owner George E. Doebler, by round-the-clock operation of a new-type material handler, the Salsbury Turreteer.

The Turreteer, made by Salsbury Motors, Inc., of Pomona, Calif., has its power unit mounted in an encased turret which swivels like the revolving gunmount of a warplane. The principle of the swiveling gunmount was successfully adapted to a commercial material handler through the co-operation and "know how" of Northrop Aircraft (the parent organization) experts. The direction of travel is altered by revolving the turret, a mechanical change which eliminates gears and transmissions.

By continuous operation of the Turreteer, The United Concrete Manufacturers have effectively done away with the bottleneck resulting from slow movement of the blocks from the machines to the curing rooms. The procedure followed is for the mold-men to load the skids at their machines, an average load of 90 blocks per skid. Loaded skids are then picked up by the handler and moved directly to curing rooms, 75 to 150 feet away.

After steam heating for 16 hours in the kilns, cured blocks, still stacked on skids on which they were first placed, are removed to storage yards. (See illustration.)

New Refractory Castable Will Withstand 3000-Deg. F.

A concrete which easily withstands temperatures as high as 3000 deg. F. has been developed by The Babcock & Wilcox Company, officials of its Refractories Division announced yesterday. Known as "B & W KAOCAST," the product is being placed on the market after a long period of successful service trials under severe conditions. Kaocast fills a need for a refractory castable in the construction of industrial furnaces operating at temperatures ranging from the top limit of standard refractory castables up to as high as 3000 deg. F.

Both in service trials and in laboratory tests, the material has shown excellent stability and resistance to palling (disintegration) under repeated heating and cooling cycles, the announcement stated. Other properties which give Kaocast its durability include its exceedingly small volume change on initial firing, and its lack of shrinkage or expansion under continuous use at high temperatures.

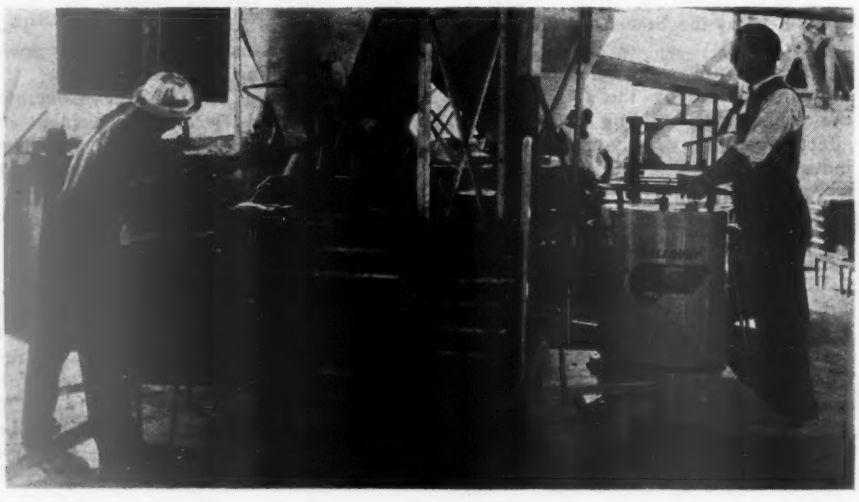
Because it can be either poured into place like ordinary concrete used in construction work, or used as a ramming mixture, B & W Kaocast should effect considerable savings in furnace construction. This is particularly true of furnaces requiring extensive use of special shapes which were formerly made of kiln-fired materials or of refractory plastics. Kaocast can be used either for the quick fabrication of these special shapes, or to form a part or all of the furnace lining.

C. C. Gilbert Named Head Of S. D. Products Assn.

Curtis C. Gilbert of Huron was re-elected president of the Concrete Products Manufacturers Association of South Dakota at the concluding session of its two-day annual convention in Watertown, S. D. Also re-elected were Sidney Flyte of Rapid City, vice-president, and Merrill Allen of Watertown, secretary-treasurer. The position of treasurer was eliminated and combined with the office of secretary.

The association named a special committee to draw up plans for a proposed state building code and specification regulations applying to the production of concrete block. Sioux Falls was selected as the convention site for next year.

In order to give prospective home owners proper information on the characteristics and advantages of concrete masonry products, the Houston (Tex.) Concrete Masonry Products Association recently promoted a campaign for the dissemination of such information.



• A fast-moving handler awaits the completion of loading at the United Concrete Mfrs. plant.

Elimination of Wall Cracks Claimed for New Process Of Curing Concrete Units

Terry Carpenter has started production in his high-pressure, steam-cured concrete products plant at Scottsbluff, Neb. The new process reduces shrinkage in concrete blocks to a point that cracking in the wall is virtually eliminated, Mr. Carpenter said.

Under the new method the blocks are cured in the retorts by high-pressure steam. When the curing is finished, the blocks are completely aged, cured and stabilized, and ready to be placed in the wall, over 95 percent of the chemical change in the blocks having taken place during the high-pressure steaming. It is claimed that the blocks have 2,000 p.s.i. strength, perfect color, less than 2 percent moisture absorption and no breakage.

Poured-on-the-Spot Homes To Sell at $3,500 in Kansas

A new method of fabricating poured-concrete houses has been perfected by Lawrence Walton of Sabetha, Kan. The system consists of pouring the walls of the building into forms laid flat on the ground and then raising the walls into position with a derrick. The walls are joined together by welding the steel reinforcing rods at the corners.

Mr. Walton built a combination garage and apartment last year in which he lived during the winter. He found the rooms dry and warm. He plans to construct four-room homes for $3,500.

Canadian Materials Firm Buys Big Block Machine

In Calgary, Alta., Canada, the members of a family-owned sand-and-gravel firm, J. E. Jeffries and his four sons, recently decided to expand their business and manufacture concrete blocks. Accordingly, they ordered a Besser Super-Vibrapac machine.

One member of the firm, Ray C., who had attended the convention of the National Concrete Products Association in Chicago with his brother Allen, decided to visit the Besser factory in Alpena, Mich., on the way home. He spent several days watching the operation and assembly of the big machine. The other Jeffries brothers are Ross and Val.

Columbus Block Producers Organize New Association

The Columbus Concrete Block Manufacturers' Association, 50 E. Broad Street, Columbus, O., was recently organized to co-ordinate promotional activities of members.

Robert G. Kern, Columbus Builders Supply, Inc., is president; John M. Swickard, Swickard & Crissman, is vice-president; and John F. Royer, public relations counselor, has been retained as secretary-treasurer.

Ready Mixed Concrete Convention in Los Angeles Is Voted a Big Success

another ON THE SPOT report

THE 17th Annual Convention of the National Ready Mixed Concrete Association held at the Biltmore Hotel, Los Angeles, Calif., March 5-7, 1947, was the first ever held on the Pacific Coast, but the enthusiastic approval of those attending made it apparent that it will not be the last. Held in conjunction with the 31st Annual Convention of the affiliated National Sand and Gravel Association, the meeting featured not only the usual vital and interesting subject matter but also excellent weather and entertainment—both official and unofficial. Many of the more than 577 producers, machinery manufacturers, etc., and their wives, had never before been to California and they now know what they have missed.

Directors Meeting The board of directors met on March 3 to discuss some of the important matters confronting the industry and the association. Vincent P. Ahearn, executive director, pointed out, as he also did later at the opening session of the convention on March 5, the excellent financial condition of the association, and the substantial increase in membership, especially in the Western states. It was also pointed out that the value of the concrete produced annually by members of the association is now about $100,000,000. Of the total of 19,000,000 cu. yd. of ready-mixed concrete produced, more than 14,000,000 cu. yd. are produced by member companies. It was also stated that the industry now uses more than 15 percent of the portland cement produced and is the cement industry's biggest single customer, with the concrete products industry in second place. It was pointed out, however, that ready-mixed concrete can be used to advantage on more than 60 percent of all concrete construction work, leaving considerable room for further expansion of the industry.

At this meeting also it was decided to continue work on a standard cost accounting system for the industry. It was also decided to continue the safety contest for members for the year ending July, 1947, and to give them the option of turning their reports in on a quarterly basis or at the end of the year as they prefer. The awards donated by PIT AND QUARRY will be presented to the winners at the 1948 annual convention.

The directors recommended, in cooperation with the sand and gravel directors, that the 1948 convention scheduled for Cincinnati should include a machinery exhibit, but left the decision on this and on the 1949 convention up to the Manufacturers' Division, which met later in the day. That body voted to hold the Cincinnati meeting and exhibit as scheduled and also went on record as favoring an exhibit for the 1949 convention and every alternate year thereafter. This apparently eliminates New York for 1949, as no suitable location for an exhibit seems to be available there.

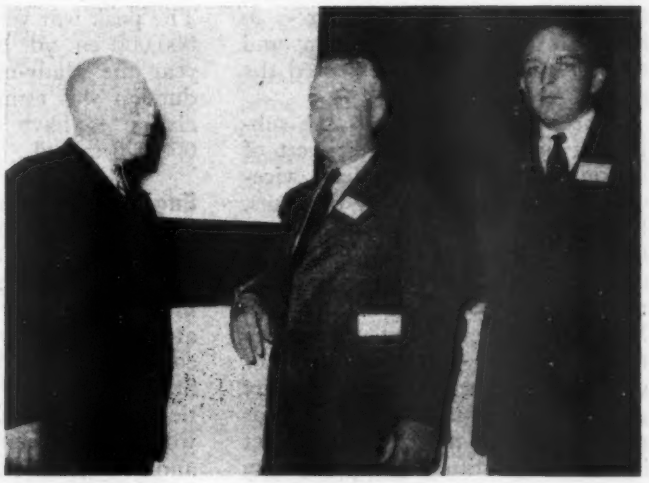
Stanton Walker, director of engineering, described some of the research work being done and some of the future plans. He also said that the A. S. T. M. specifications on ready-mixed concrete are being thoroughly overhauled and that some provision may soon be made for the use of non-agitating equipment for hauling air-entrained concrete. It was also decided at this meeting to continue the studies of rear-end troubles with mixer trucks. Mr. Walker's recent election to the presidency of the American Concrete Institute was announced.

Attendance—Programs In the subject matter at the meetings and in their attendance these conventions showed clearly the closeness of the two industries in their aims and problems and the extent of interlocking ownership. Of the six half-day sessions held, two were of interest primarily to sand and gravel producers, and two were of equal interest to both. It is also significant that of the 259 producers registered 95 produce only ready-mixed concrete, 57 produce only sand and gravel, and 107 produce both. The registration list also included 144 equipment manufacturers, 151 ladies, and 23 guests.

One afternoon during the week was set aside for a tour of inspec-

• Below, left: New officers of the National Ready Mixed Concrete Assn. (left to right)—secretary-treasurer, Robert F. Porter, H. T. Campbell Sons Corp., Towson, Md.; president, Frank P. Spratlen Jr., Ready Mixed Concrete Co., Denver, Colo.; vice-president, C. (Dolly) Gray, Ready Mixed Concrete Corp., Indianapolis, Ind.

• Right: A group of delegates (left to right)—W. D. M. Allan, Portland Cement Assn., Chicago; C. W. Shirey, Waterloo, Ia.; M. E. Sundt, Albuquerque Gravel Products Co., Albuquerque, N. M.



tion of local ready-mixed concrete plants. Another afternoon was devoted to the inspection of sand and gravel plants, and both were well attended.

Election of Officers The election of officers was held in accordance with the association's custom of electing officers every year and new directors for three years on a rotating plan. The new officers are: Frank P. Spratlen, Jr. (Ready Mixed Concrete Co., Denver, Colo.), president; C. "Dolly" Gray (Ready Mixed Concrete Corp., Indianapolis, Ind.), vice-president; Robert F. Porter (Harry T. Campbell Sons Corp., Towson, Md.), secretary and treasurer. The new directors are: John W. Roberts (Southern Materials Co., Inc., Richmond, Va.); Walter F. Tews (Tews Lime and Cement Co., Milwaukee, Wis.); A. W. Kimmel (Ready Mixed Corp., Dayton, Ohio); and Richard K. Humphries (Pacific Coast Aggregates Corp., San Francisco, Calif.), who had just completed the unexpired term of E. J. Goodpastor of the same company, resigned.

Joint Luncheon At the joint luncheon of the two associations on March 5, Robert Mitchell (Consolidated Rock Products Co., Los Angeles) was presented with a scroll and a ring by 24 rock, sand and gravel and ready-mixed concrete producers in the six southern California counties. The scroll, signed by each of the 24 companies, read as follows: "In recognition of the outstanding achievement in the interest of the Rock, Sand and Gravel and Ready Mixed Concrete Industries, both nationally and locally, accomplished by Robert Mitchell for his untiring efforts in handling the problems of these industries, and the splendid leadership he has provided as President of the National Sand and Gravel Association during two war-time years, we express to him our sincere appreciation and thanks." Mr. Ahearn presented the award.

American Problems was the subject of an address by the guest of honor, William M. Jeffers, vice-chairman of the board of directors, Union Pacific Railroad. After a few remarks regarding his efforts during the War in getting the synthetic rubber program under way, Mr. Jeffers embarked upon the theme that we must all work together to achieve economic stability and forget about "something for nothing." We must, he said, get back to the attitude of opportunity and reasonable security for all. He advocates legislation which will prevent strikes in shipping, railroads, coal mines and other public service industries and the elimination of the closed shop. According to Mr. Jeffers we must sell America to our youngsters and teach in our schools that each must contribute to society, and that we owe people only what they earn. We need, he said, more patriots and fewer politicians.

President's Address President Charles Shirey (C. W. Shirey, Waterloo, Ia.) called the National Ready Mixed Concrete Association to order on Wednesday morning, March 5, for the opening session. He reported a gain in active membership during 1946 of 49 producing companies, bringing the total as of the first of this year to 265, or 23 percent since the last meeting. Mr. Shirey urged that producer-members at all times avail themselves of the invaluable technical and administrative assistance rendered by the association staff so that, individually as well as collectively, the membership obtain the fullest benefits accruing to affiliation with the organization.

Secretary's Report The need for a rigid pricing policy was stressed by Executive Secretary V. P. Ahearn in his annual report. The wide variation in certain areas and the lack of firmness in quotations was decried as poor business which detracts from the industry generally.

Approximately 15 percent of all the cement produced is being taken by the ready-mixed-concrete plants, while 25 percent of all cement utilized in construction in any form is now being marketed in the form of ready-mixed concrete, said Mr. Ahearn, an indication of the growing importance of the industry in the American construction scene. The peak war year—1942—saw 24,000,000 cu. yd. produced while last year the ready-mixed-concrete production was estimated by the association to have totaled about 19,000,000 cu. yd.

Engineering Report Studies of volume change, durability, and air-entrainment are occupying the major share of the association's research attention at the University of Maryland, according to Director of Engineering Stanton Walker. Laboratory facilities were established in 1944 in a working arrangement with the sand-and-gravel association. Mr. Walker reviewed the gains made in cooperation with other technical organizations, principally the American Concrete Institute (of which he was recently elected president), the American Society for Testing Materials, the Highway Research Board, and the Public Works Association.

Safety Contest A progress report on the association's first annual safety contest by Harry F. Thomson (General Material Co., St. Louis) and Mr. Ahearn revealed that accidents are costing the ready-mixed industry from 3 to 5 cents per cubic yard of concrete delivered. Viewed strictly from the economic viewpoint, this is entirely too high and efforts must be made to attain a sharp reduction in accidents and the resultant liability imposed, it was declared.

The first contest, which started last July and which will be completed in July, 1947, may not yield much factual data on a comparative basis due to the failure of competing concerns to turn in complete reports. For the first two quarters, only 32 companies reported all-inclusive factual data, while several additional concerns began sending in report data during the second quarter.

It was generally agreed that safety in the industry is of paramount importance, since the public regards the large trucks with their drums revolving in transit as a definite hazard, more fancied, of course, than real. An instance of public reaction, recounted by Mr. Ahearn, had to do with a much-publicized and spectacular accident involving a truck-mixer in Washington, D. C., following which a movement was reached seeking to bar the use of the Capitol's streets to truck mixers. Feeling later died down but it was stressed as an example of why this industry needs to assume a more active role in promoting safety and better public relations particularly because of its close contact with the public.

Safety trophies for the winners of the first contest, to be presented at the 1948 convention in Cincinnati, will be awarded by Pit and Quarry. The design of the trophy has already been reviewed and given association approval.

Truck Chassis Standard motor trucks have generally proved inadequate for the ready-mixed concrete industry and the association's Committee on Truck Chassis is carrying its plea for special designs direct to the nation's

leading truck manufacturers. This was brought out in the report by the committee at the Wednesday morning session. Much of the trouble has been of the "rear end" variety, according to a questionnaire survey conducted by the committee, the standard differential and axle apparently being insufficiently rugged. Up to 88 percent of the gross loads on mixer trucks is being borne by the rear-axle assemblies on present-day truck chassis.

Considerable evidence has been produced, the report revealed, to show that overloading is responsible for some of the trouble and that the practice is far too common to ignore.

Translated into terms of concrete yardage, it was pointed out that most states now permit loadings equivalent to about 2¾ cu. yd. on two-axle units and approximately 4½ cu. yd. on tandem-drive trucks. A definite trend toward heavier and larger equipment is being noted in the industry and hope was expressed that, as the truck manufacturers get back into production somewhere near normal, equipment more suited to the industry will begin rolling off the production lines.

Durability of Concrete *Durability of Concrete as Affected by Aggregates,* was the subject of a technical paper presented by Thomas E. Stanton, materials and research engineer of the California Division of Highways.

The paper dealt entirely with California experience and was prefaced by the statement that no evidence of unsound concrete as affected by the aggregates had been observed except the excessive concrete expansion which developed in pavements and other structures where the alkali constituents of cement had reacted adversely with certain minerals in the aggregates. These minerals have been identified as opal in the opaline charts, and the glass matrix of some volcanic rocks. Sodium and potassium oxide have been found to be the culprits in the cements, but only when present in a combined quantity greater than 0.60 percent. The gel or silicate resulting from the reaction has caused pressures which have ruptured certain pavements, bridges and other structures. The opal-bearing charts and shales occur from the most part in Upper Miocene sedimentary deposits along the coast between Los Angeles and the Monterey peninsula. Some of the Andesites and other volcanic rocks of the Sierra Nevadas have been the offenders in the volcanic-glass group.

• Hal G. Feraud, Southern California Rock Products Assn., and M. E. Rinker, Rinker Materials Corp., W. Palm Beach, Fla.

Some shales have been found to expand excessively when saturated with water or when they are alternately wet and dry, the speaker said, and the percentages of such material are kept at a practical minimum. The action appears physical and of much less intensity than the chemical reaction between minerals and the cement.

• Mr. and Mrs. A. R. Shiely, J. L. Shiely Co.—Guaranteed Concrete Co., St. Paul, Minn.

The chemical reaction producing excessive expansion apparently occurs, Mr. Stanton stated, only when the cement component contains an appreciable percentage of alkali in the form of sodium and potassium oxides, or the aggregates contain high percentages of alkali to supplement the alkali in a low-alkali cement. It is of an intensity roughly proportional to the percentage of the alkalies, apparently being of such low order as to be negligible when the alkali content is less than 0.6 percent.

Summing up, Mr Stanton is of the opinion that the solution to the problem of concrete durability under the conditions described appears to be the utilization of a low-alkali cement combined with the greatest practicable reduction in the percentage of the rock types which are definite contributory agents.

• George H. and Leonard W. Tews, Tews Lime & Cement Co., Milwaukee, Wis.

A number of slides were shown to illustrate some of the typical failures which had been observed due to the expansion described.

Lightweight Aggregates *Lightweight Aggregates for Concrete* was the subject of a short talk by Raymond E. Davis, professor of civil engineering at the University of California. The country is becoming lightweight aggregate conscious, according to the speaker, and an increase in the use of the various forms is certain.

In World War I, Haydite was first used structurally in building concrete ships. Cores cut from these old hulks 23 years later showed compressive strengths running as high as 10,000 p.s.i. Concrete ships built during World War II used manufactured aggregates produced by exfoliating shales and diatomaceous minerals; *i.e.* Nodulite produced at Tampa, Fla., Airox at Santa Maria, Calif., and Rocklite at Ventura, Calif. The last named proved to be the outstanding one in the group in Professor Davis' opinion. Strengths up to 6,000 p.s.i. were obtained.

Volcanic cinders, scoria, and pumice are popular in the West because of their wide occurrence in nature and their relatively low cost. Pumice, he said, is the only one in the group with real potentialities. The first recorded use of concrete blocks made with pumice aggregates was in constructing the laboratory building at the University of California in 1931 under Professor Davis' direction.

Perlite is the focal point of considerable experimentation at present in California and Arizona. This extremely light material, despite its friability, gives promise of wide util-

ization after production becomes standardized.

For the ready-mixed-concrete industry, the greatest market for lightweight concrete lies in the erection of multi-storied structures where weight reduction is the important factor, in the opinion of the speaker.

The Bureau of Standards is now conducting tests with various lightweight aggregates and air-entraining agents which will have an important bearing on future use, Professor Davis believes. This combination is resulting in low-strength concrete in the 400 p.s.i. range, but the insulating value of the resulting concrete is high and, most important, there is little if any penetration by moisture.

Air Entrainment *Control of Quantity of Entrained Air in Concrete* was the subject of a talk by Stanton Walker at the final ready-mixed meeting on March 7. He said that air entrainment, if properly applied, increases the durability of concrete two or three times and even further increases its resistance to freezing and thawing. Three slides showed that with ordinary cement the concrete strength varied with freezing and thawing according to the quality of the fine aggregate but that when air-entraining cement was used all concretes were good regardless of the qualities of sand used. Slides showed the results of similar tests with coarse aggregates of varying qualities, and here again air entrainment overcame any aggregate deficiencies.

According to Mr. Walker, his research has shown that the compressive strength of a concrete drops 3 to 4 percent for each percent of air entrained and that it is unsafe to use more than 5 or 6 percent of air. The leaner mixes and finest aggregates, he said, entrain the most air.

• Louis P. Price, Clarke-Halawa Rock Co., Honolulu, T.H., and Frank Kelly, Colonial Sand & Stone Co., New York, N. Y.

In discussing the controversial subject of cement-entrained versus plant addition of the entraining agent, he said that when interground in cement no variations are possible to meet different conditions. Addition at the plant, he said, raises a design problem but if once solved the practice is easy to carry on.

Mr. Walker then described three methods of determining the percentage of air entrainment in a concrete. The gravimetric method, he said, can cause considerable error under any other than laboratory conditions and is not recommended for field use. With the volumetric method, he said, it is difficult to remove all the air and this method is susceptible to error. The pressure method he recommends was first suggested by W. H. Klein, then of the Pennsylvania-Dixie Cement Corp. and now with the Lawrence Portland Cement Company, and was developed by Mr. Walker and his assistants in the association's laboratory. It uses Boyle's law of gas compressibility and is cheap, compact, quick and accurate even under field conditions. A similar unit, he said, was developed by the Minnesota State Highway Department and another by the Portland Cement Association. The last-mentioned unit was shown and described at the recent A.C.I. meeting and consists of a bowl-shaped container which is filled full of concrete and then struck off level. A cap is then sealed on which has a water glass extension and a pressure gauge. The glass is filled with water and closed and then air is pumped in to a certain pressure depending on the altitude—7½ lb. is correct for Los Angeles. The reduction in volume is then read on the glass and this can be calibrated to read direct in percentages of air entrained.

• Some of the producers on an inspection trip at the plant of the Blue Diamond Corp. at Los Angeles.

Advertising and Promotion Merchandising and the development of ready-mixed-concrete markets occupied much of the attention at the closing session of the National Ready Mixed Concrete Association on Friday morning, March 7.

Translation of the huge backlog of construction into concrete yardage is going to require a tremendous selling job, W. D. M. Allan, director of promotion of the Portland Cement Association, pointed out in his talk on market development through advertising and promotional campaigns. In this connection, the revision of many existing building codes will be of prime importance, and Mr. Allan urged that producers avail themselves of the assistance which the district offices of the P.C.A. can provide in analyzing local codes and suggesting changes beneficial to the concrete industries. Last year the organization which he represents was instrumental in effecting changes or enactment of new codes in 62 communities, Mr. Allan declared.

Figures submitted by the cement associations' 25 district offices show that housing will lead all other construction activity in dollar volume in 1947, followed by highways, structural, farm and conservation building in the order named. The secondary highway building program, incidentally, bids fair to top any other year in history, said Mr. Allan.

Analysis of housing construction in 1946 shows 21.6 bbl. of cement used per unit, and it is aimed to increase this in 1947 through intensive promotion with the result that 3.8 cu. yd. more concrete should go into each dwelling erected. If the predicted 1,000,000 new homes are built, this should mean 3,800,000 cu. yd. more concrete in this branch of construction activity alone, it was pointed out.

A recent P.C.A. "complaint" survey of the ready-mix industry, pointing the way to insuring future markets by overcoming the features complained of, brought out the fact that objections to the various phases of delivery, including waiting-time penalties, topped the list, 89 percent of the 127 replies indicating delivery was the main source of irritation among users. Other complaints of a

major nature involved prices, strength (or lack of it), and workability.

Education of the consumer and the contractor in the superiority of ready-mixed over job-mixed concrete, plus the fact that ready-mix is of certified quality, economical, and available in any quantity at any time, are the main points deserving emphasis in any promotional program, in Mr. Allan's opinion. Printed literature, advertising, job and truck signs, and the radio are the most effective media for promulgating these points, he declared. Professionally-prepared advertisements covering these points are available in matrix form from the Portland Cement Association without charge to any ready-mixed-concrete producer. A display of these advertisements at the convention attracted considerable attention.

Merchandising An open forum on marketing, with Robert C. Collins (Warner Co., Philadelphia), chairman of the committee on merchandising, serving as moderator, developed some lively discussion. Mr. Collins introduced the subject by pointing out the tremendous growth of the industry in a comparatively few years as proof that the premixed material is filling a definite need.

From the viewpoint of a new producer, Eugene Sundt (Albuquerque Gravel Products Co., Albuquerque) told how, in the space of less than six months, his firm had reached top position in an area which already had ready-mix service. He attributed his company's success to a careful analysis of the market. After determining that really good concrete was the answer, the company built a plant and set up an organization which never batches a yard of concrete that is not of premium quality. The material is sold exclusively on a guaranteed strength basis. Booklets, advertising in the local newspapers, and a radio program, are being used to promote the company's products in the Albuquerque area.

Considerable discussion arose concerning the industry's old bug-bear —the problem of delays on the job. Avoiding conflict in this regard was felt to be a step toward good merchandising. Several of the producers present reported that they have service men who visit each job being poured at frequent intervals to expedite the quick unloading, proper spacing of truck arrivals, etc., thus eliminating considerable conflict before it can arise. A 15-minute "free" waiting period seemed to be general practice while overtime charges run from $4 to $6 per hour. The consensus among the producers, however, was that the charge, whatever the amount, was merely a token penalty and does not compensate the operator who would much prefer to have his truck-mixers available for deliveries that can yield him a much greater hourly income.

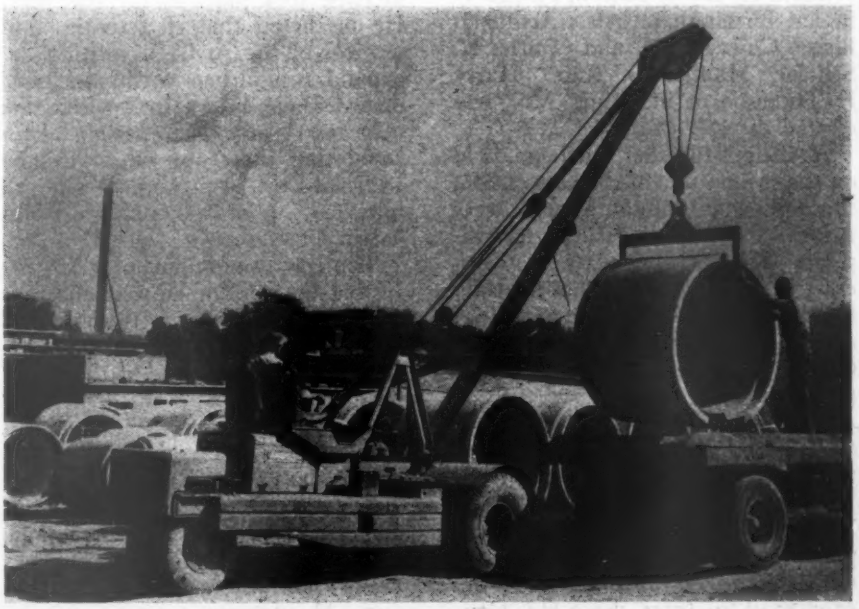
Many agreed with Mr. Thomson that contractors in particular usually feel that any delays that develop on their part are offset by delays on the part of the ready-mix operator who fails to get his trucks to the job at the time the forms and workmen are ready to make a pour. While some of the operators insisted that they always reach the job with material at the appointed time, others admitted they were frequently guilty of delaying the work. The problem apparently will never be completely solved as long as the human element is such an important factor, but it was felt that considerable progress has been made and will continue to be made in alleviating the condition.

Plant Tour Four ready-mixed-concrete plants in the area were on the itinerary for an inspection tour on Friday afternoon, March 7, as the closing event of the meeting. At the first plant, the Alameda St. branch and main offices of the Blue Diamond Corp., luncheon was served in the company's garage and maintenance building, which had been readied for the occasion and made spic-and-span for the visitors. The next stop was at Consolidated Rock Products Co., Alameda St. branch plant where the concern's new batching plant was given close inspection, while many of the producers spent considerable time in the laboratory where a pressure-meter demonstration took place in connection with air-entrainment experiments being conducted by Consolidated. The adjoining new concrete-block plant of Wailes-Bageman Co. also attracted considerable attention. The Noble batching plant serves a dual purpose at the block plant, supplying lightweight pumice concrete to both the block plant and to Consolidated's truck mixers when lightweight structural concrete jobs are being serviced.

Two other model plants were on the itinerary, those of the S. H. Bacon Materials Co. at Huntington Park and E. Lockett & Son at Pasadena, and darkness had settled over the California landscape by the time the busses returned the visitors to the Biltmore.

Neb. Concrete Masonry Assn. Elects Officers at Omaha

Earl W. Peterson of Omaha was elected president of the Nebraska Concrete Masonry Association at the annual meeting held in Lincoln. Other officers elected were M. H. Finney of Grand Island, vice-president; Chris Hanley of Chappell, second vice-president; Paul B. Moser of Lincoln, secretary; and Horace Young of Wahoo, treasurer.



• At the plant of the Concrete Pipe & Products Company, Richmond, Va., a Krane Kar, product of the Silent Hoist & Crane Co., Inc., is currently serving as shown in the accompanying illustration. Shown here is a pipe section weighing 7,715 pounds (66-inch inside diameter) being lifted by the Krane Kar to the truck. The Concrete Pipe & Products Company is the first to use this type of equipment for stripping, turning and yarding pipe.

Stanton Walker Elected President of A. C. I. at 43rd Annual Convention

another ON THE SPOT report

AT its 43rd annual convention, held at the Netherland Plaza Hotel, Cincinnati, the American Concrete Institute elected Stanton Walker to serve as president of the organization until the 1948 convention. Mr. Walker has been a member of the Institute since 1921, a

By WILLIAM M. AVERY

member of the board of directors since 1940 and has served as vice-president for the last two years. He is well known to readers of PIT AND QUARRY and THE CONCRETE MANUFACTURER as director of engineering of the National Sand and Gravel Association and of the National Ready Mixed Concrete Association. Mr. Walker, whose headquarters are in Washington, D. C., succeeds Harrison F. Gonnerman, director of research, Portland Cement Association.

Other officers elected at the three-day meeting include Vice-presidents Robert F. Blanks of Denver, Colo., and Herbert J. Gilkey of Ames, Ia. Directors of the six regional districts are, in the order named: Paul W. Norton, Boston, Mass.; Roy R. Zipprodt, New York City, N. Y.; William H. Klein, Easton, Pa.; H. P. Bigler, Birmingham, Ala.; Arthur J. Boase, Chicago, Ill., and Charles H. Scholer, Manhattan, Kan. Harry F. Thomson of St. Louis, Mo., was elected director-at-large.

At the get-together luncheon, held on the second day of the convention, the following annual awards were made: to Gerald Pickett for his paper *Shrinkage Stresses in Concrete,* the Leonard C. Wason medal for the "Most Meritorious Paper" of A.C.I. Proceedings, Volume 42; to Charles E. Wuerpel for work reported in his 1945 paper entitled *Laboratory Studies of Concrete Containing Air-Entraining Admixtures,* the Leonard C. Wason medal for "Noteworthy Research"; to J. W. Kelly and B. D. Keatts for their paper entitled *Two Special Methods of Restoring and Strengthening Masonry Structures,* the A.C.I. Construction Practice Award; to Morton O. Withey "in recognition of 40 years of outstanding contributions to our knowledge and understanding of concrete and reinforced concrete," the Henry C. Turner medal. The awards were presented by the retiring president, Harrison F. Gonnerman.

In his final address to the members of the institute, Mr. Gonnerman

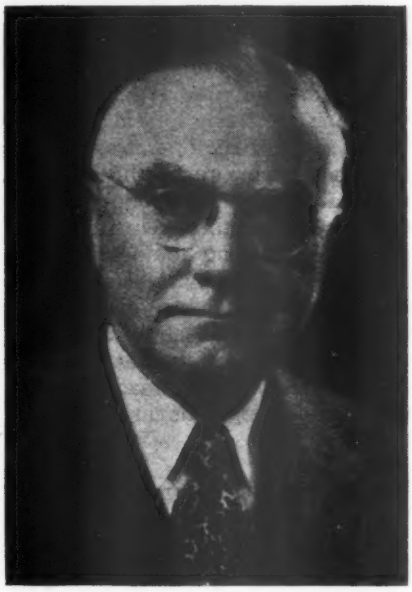


Photo by Harris and Ewing
Stanton Walker

reported that in September, 1946, membership in the organization passed the previous peak reached in March, 1929, and that a 34 percent increase took place in the past year. He predicted that if activities and services of the A. C. I. continue to expand, a total membership of 5,000 or 6,000 may be attained within the next few years. He strongly advocated that the scope of services be widened to attract men in all branches of professional work involving concrete.

The role cement can play in alleviating the present housing shortage was outlined in an entire morning's session devoted to precast concrete. In discussing problems in the structural framing of precast concrete houses, A. Amirikian, head engineer, Bureau of Yards and Docks, Navy Department, stated that the many difficulties of building with traditional materials at present have done a great deal to overcome prejudices against precast concrete construction. He described construction by the Navy Department of houses using thin-shell rib slabs as basic units in sidewalls, floors and ceilings. For the weight involved, he said, these slabs developed remarkably high strengths. The slabs are framed with primary and secondary ribs, and joined together on the job site with simple bolt connections. The main ribs are 6 to 10 inches deep.

A paper entitled *Precast Concrete Houses* described a 585-house project near Philadelphia using vacuum-process precast panels. In this process, which is owned by Vacuum Concrete, Inc., a negative concrete mold made from a wood pattern is used. After the concrete is poured, excess water is removed by means of large mats connected to vacuum tanks. The vacuum mats are also used for stripping and lifting the panels, so that no excessive local strains or bending moments are set up in the green concrete.

The high-early strengths (up to 3,000 pounds at 16 hours) gained with vacuum-processed concrete make it possible to erect the wall panels the day after they are poured. Ultimate strengths of 6,000 p.s.i. are said to be obtained. Other advantages claimed are fine surface texture, extreme hardness and a reduced tendency to develop shrinkage cracks. Poured-in-place closure columns joining adjacent panels are poured with forms held in position by vacuum, eliminating the need for form ties or exterior bracing.

Louis P. Corbetta of the Corbetta Construction Company, New York City, N. Y., described some of his company's experiences and observations as contractors in the construction of precast concrete warehouses for the U. S. Navy at Mechanicsburg, Pennsylvania. In all, five 200-by 600-foot warehouses were constructed, three of which were conventional steel-frame buildings and two of precast concrete construction. For the latter, hollow-box reinforced-concrete girders and columns were cast near the site and erected, after a suitable interval for curing, in much the same fashion employed for steel construction. The concrete buildings were completed 15 days before the steel structures. Although costs were somewhat higher for the concrete warehouses, Mr. Corbetta said, a net saving would have resulted had precast concrete been used for all five of the structures.

A paper entitled *Concrete Mix*

(*Continued on page* 112)

Ready-Mix Plant Utilizes Two-Level Site for Cheap Handling of Materials

another ON THE SPOT report

PROBABLY one of the simplest and most effective methods of securing important economies in the handling of materials is by utilizing natural elevational differences in the plant site. Seldom have we seen a better application of this principle than at the ready-mixed-concrete plant of Reed & Abee, Inc., Asheville, N. C. The plant site is divided by one of the main highways leading out of Asheville, and on one side it is flanked by a 60-ft. bluff formed by the excavation work for the highway.

Since the entire property lies well within the corporate limits of Asheville, the summit of the bluff is

By WILLIAM M. AVERY

reached by way of a well-maintained city street. The potentialities of this setup were too good to pass up, and the company decided to locate its batching plants against the bluff and feed the plants by gravity. As the accompanying illustration shows, the bins are fed from the top of the bluff by means of four wide chutes which are supported by heavy timbers. The chutes are wide enough so that the trucks can dump into them directly, and the slope is such that approximately as much material may be stored in the chutes as in the bins themselves.

Two separate batching plants are used in order to gain flexibility in the range of specifications which may be handled. In the photograph the batcher on the left is a Butler plant; the Blaw Knox plant on the right is concealed by a cement house which stands between the two structures, but the chutes and the tops of the bins are visible. In all, more than 400 tons of aggregates can be stored. Sand and crushed gravel, supplied in trucks by the Grove Stone & Sand Company of nearby Swannanoa, are used exclusively.

• A view of the new 600-bbl. bulk cement plant of Reed and Abee, Inc., Asheville, N. C. This and an older 300-bbl. plant are located across the highway from the batching plants.

• A general view of the company's ready-mixed concrete plant. Aggregates are trucked to the top of the bluff and dumped into chutes which feed the two batching plants. Nine of the company's 15 2-cu.-yd. mixers are shown.

The company originally used bagged cement, which explains the cement house that stands between the two batching plants. When the increased volume of business ruled out this mehod of operation, a 300-bbl. Blaw-Knox bulk cement plant was set up on the opposite side of the highway, where rail facilities were available. More recently a 600-bbl. Heltzel plant (see illustration) has been installed to increase cement storage capacity and expedite batching operations.

Reed & Abee in December, 1945, standardized on Master Builders' Pozzolith, which is an admixture added with an automatic dispenser to all mixes. The company reports that all its customers have been won over to the practice, and that a number are quite enthusiastic about the finishing characteristics of the concrete now being sold.

Although use of the cement-dispersing agent has effected some reduction in the amount of cement consumed, the company's policy has been to furnish concrete at the same cost as formerly, giving the customer an extra dividend in the form of higher-strength concrete. Reports from the Pittsburgh Testing Laboratory show that in spite of the cement reduction strengths are running 10 to 40 percent higher since cement dispersion was adopted.

Dry Pozzolith powder is placed in solution in two separate 650-gal. tanks located in the old cement house. The solution is pumped from

• The automatic dispenser used in connection with the cement dispersing agent.

• The operator's room in one of the batching plants. All water additions are measured with the meter on the left.

• One of the company's 15 mixer trucks taking on water.

the tanks to automatic dispensers located on the control platform of the two batching stations. In an average week three tanks of the solution are consumed. Water additions, which are also made at the aggregate batching plants, are measured with Pittsburgh Equitable meters.

The company's output of ready-mixed concrete ranges between 1,500 and 3,000 cubic yards per month. Deliveries are made within an average radius of six miles with fifteen 2-cu.-yd. transit mixers. The fleet consists largely of Rex Moto-Mixers but also includes Smith-Mobile and Jaeger machines. Eight of the mixers are of the high-discharge type.

Reed & Abee entered the ready-mixed-concrete business about 10 years ago, as an expansion of the firm's activities in the general contracting field. The company makes highway markers and precast-concrete products on special orders only. Officers of the concern are Hugh H. Abee, president; A. M. Brown, vice-president, and Charles Martin, secretary-treasurer. J. H. Cole is plant superintendent. Seventeen men are employed in the company's ready-mixed-concrete operations.

Stanton Walker Elected

(*From page* 110)

Design, prepared jointly by Myron A. Swayze, director of research, and Ernst Gruenwald, manager, "Incor" Division, Lone Star Cement Corp., was presented to the convention by Mr. Swayze. It described a modification of the Fineness Modulus method of mix design wherein the cement is included in the modulus figures. This modification of the Abrams F M theory permits the design of equally workable batches of varied cement contents from data on trial mixes of a single cement factor.

Carl A. Menzel, of the Portland Cement Association's research laboratories, described the development and study of various apparatus and methods for determination of the air content of fresh concrete. Mr. Menzel showed slides comparing the accuracy of determinations by the Indiana, stirring, rolling, modified rolling and pressure methods. In the last-named method, the sample is inundated and placed under pressure to determine the air content. Although for very porous aggregates the pressure method has the disadvantage of necessitating the use of a correction factor, it makes possible a complete determination in about 8 minutes, as compared with 12 to 16 minutes by either the rolling or modified rolling methods. Apparatus used for the pressure method weighs only 65 pounds, and can be packed in a chest measuring 12 by 12 by 26 inches. It tests a 22/100-cu.-ft. sample using air pressure of 7½ or 8 pounds.

T. H. Chisholm of the Hydro-Electric Power Commission of Ontario described his company's 25 years of experience in painting the interior of concrete buildings. The commission's experience, Mr. Chisholm said, indicates that painting concrete presents no more serious problems than are encountered in the painting of wood surfaces. He recommended the use of a base coat and two finish coats on new concrete surfaces. Where low reflection and frequent washing are required, a semi-gloss paint is to be preferred.

In another paper the use of a solution of 2 percent zinc chloride and 3 percent phosphoric acid in water was prescribed for the treatment of exterior concrete surfaces before painting. By thus depositing insoluble salts on the surface of the concrete, it was stated that oil paints should last longer on concrete than on wood—up to a maximum of perhaps 10 years.

On November 12, 1946, the St. Louis office of the Clipper Manufacturing Company was consolidated with the newly-completed factory and general office building in Kansas City, Mo. The warehouse at 4030 Manchester Street, St. Louis, Mo., will be kept intact as a permanent shipping point for customers in this area.

The new facilities, located at 2800 Warwick Street, Kansas City 8, Mo., contain a laboratory in which to test cutting results on every type of masonry material. All advertising, material purchases and engineering work will be handled in the new plant.

The Atlas Steel Construction Company has announced that it has changed its firm name to Concrete Forms Corporation. Home offices will be at Irvington-on-Hudson, N. Y., and sales offices at 43 Cedar Street, New York City.

This company specializes in forms for concrete construction, such as tunnel forms, bridge piers, wall and flat slab forms, caissons, bins, steel centering, and sewer, road and manhole forms.

Towmotor Corporation, Cleveland, O., manufacturer of fork lift trucks and industrial tractors, has completed a new building which virtually doubles present plant area by providing more than 33,000 additional square feet for assembly lines, as well as dock loading space for both outgoing freight cars and motor trucks.

Charles E. Smith has been advanced to the newly-created position of executive vice-president of Towmotor Corporation, Cleveland, O., as announced by Lester M. Sears, president. Mr. Smith, who joined Towmotor as sales manager in 1941, has been vice-president since January, 1943.

Progressive New Illinois Block Plant Serves Suburban Area of Chicago

another ON THE SPOT report

NEW home construction in Westmont and Clarendon Hills, Ill., western suburbs of Chicago, is taking practically all of the block produced by the new plant of Westmont Cement Products. Contractors in other towns within a 10-mile radius are also being served by this new plant, which got its roof "one day ahead of the first snow," according to Conrad Krodell, president of the corporation.

Improvements have been made constantly since that day last No-

By ROBERT W. SPAKE

vember, and the plant is still not complete in every way. Nevertheless, between 1100 and 1400 blocks can be produced daily, with some of the production being set aside for use in expanding the plant building.

The plant itself is located on the eastern edge of Westmont, a rapidly-growing little town of 3500 population. It is very advantageously placed for a block plant, in that it is located on property leased from the Chicago, Burlington and Quincy railroad, and adjoins a siding. Bag cement can therefore be delivered to the plant in carload lots and unloaded directly from the car into the second-floor storage loft above the drying rooms. Bag cement is preferred by this company since this material is also retailed by the corporation. For this same reason air-entraining cement is not used and only "Lehigh" portland cement is stocked.

A temporary 15-cu.-yd. bin, made of concrete blocks, is used for aggregate storage. The west wall of the plant building forms one wall of this bin, and aggregate (pea gravel or limestone screenings) is shoveled directly into the mixer through a small door. Mr. Krodell said that slag and cinder blocks will be produced later, when additional bin space is available. Cinders that do not require crushing can be obtained, and were used with excellent results in his prewar plant, since dismantled.

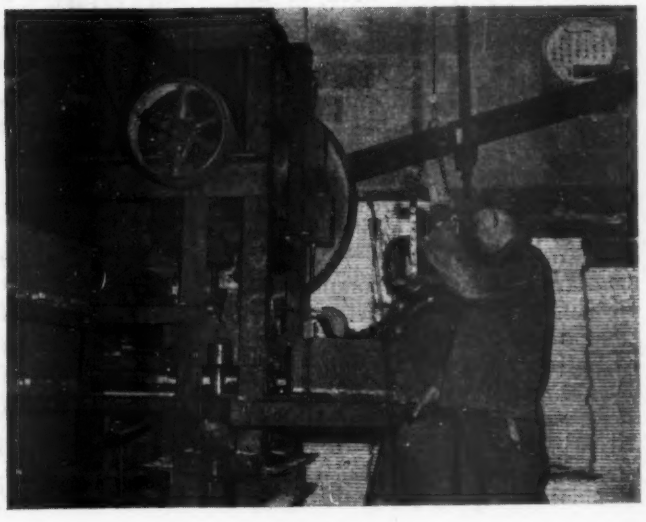
• View of the plant building, looking north. Aggregate bin is shown in upper left corner of illustration. Kiln runs toward camera, with slab base for projected 6x7½x50-ft. kiln. Block storage yard to right.

Aggregate is delivered in dump trucks, the pea gravel coming from a pit 12 miles away. The limestone screenings are a by-product of a quarry seven miles away. A sloping earth ramp permits the trucks to dump directly into the bin, after having weighed in on a Fairbanks-Morse truck scale.

Bags of cement are conveyed down to the mixing floor by means of a roller-type gravity conveyor. A 12- cu. ft Monroe open-drum batch-type mixer, operated by a 5-hp. motor and a V-belt drive mixes the concrete. A hopper of the below-the-floor type, with sufficient capacity to receive a batch discharge from the mixer, feeds a

(*Continued on page* 116)

• Left: Joseph Spurney, offbearer, and Conrad Krodell, machine operator, turn out another standard block.



• Right: Automatic tamper block machine in foreground. Note the homemade offbearer; gravity-type bag conveyor in background.

WIRE MESH SPECIFICATIONS PRESENTED TO A. C. P. A. AT MEETING IN ST. LOUIS

another ON THE SPOT report

By ROBERT W. SPAKE

TWENTY-THREE manufacturers' representatives and over 120 members gathered atop the Statler Hotel in St. Louis on Monday, February 24, to attend the 39th annual convention of the American Concrete Pipe Association.

Opening the meeting on Monday morning, Elmer L. Johnson, in his report as president, reiterated the principles of the association and added that he personally felt that one of the greatest benefits of belonging to the association was the opportunity it provided to interchange ideas with the other members. Mr. Johnson also said that it was his firm belief that dues collected by the association should be spent in the year collected, so as to benefit most the members who had contributed.

The managing director of the association, Howard F. Peckworth, reviewed the dealings of the association with the OPA and gave details of the new activities of the A.C.P.A. A personalized advertising service is being set up which will permit members to send photographs and copy to the Chicago office of the association, where they will be turned into advertising leaflets and pamphlets at cost.

The technical committee report, submitted by Chairman E. F. Bespalow, told of progress that has been made on the hydrogen sulphide problem and on a manual of bedding and backfilling. He also described the proposed work at the University of Minnesota on flow, ability of pipe to bear weight, and other pipe problems. Mr. Bespalow then introduced a recommendation for simplified practice for wire fabric used in concrete pipe manufacture. This list of approximately 45 types of mesh was agreed upon by a joint meeting of the technical committees of the Wire Reinforcement Institute and the committee of the A.C.P.A. The project caused a great deal of discussion, with many comments coming from the floor. Several members held that adoption of the simplified list would be harmful to their business, while Mr. Bespalow maintained that the list should be adopted to insure a supply of mesh for everyone, if not in all sizes, then in logical sizes. The recommended list is shown below.

The secretary, E. H. Fox, took the floor and announced that the A.C.P.A. was now incorporated in Illinois as a non-profit organization.

H. Eschenbrenner, A.C.P.A. vice-president, and E. L. Johnson, president.

Mr. Peckworth returned to remind members that the new census survey must be answered, according to law. This survey concerns an overall tonnage report, with no breakdown of production. The information contained therein cannot be revealed by the Bureau of Census to any other governmental agency, including the Department of Justice.

At the jam session held in the ballroom in the afternoon, E. F. Fox, secretary of the association, presided. He was backed up by a panel of experts on various phases of the industry. A number of topics of great interest were discussed. The simplified wire mesh standard was discussed again, as well as a proposal that the association list agricultural drain tile as equivalent to irrigation tile for dues purposes. This would permit members to pay 50 percent of normal dues on this product. There was also a discussion of the possibilities of making a successful asphalt joint on 48-inch concrete pipe. Other questions discussed included the following: The possibilities of substituting concrete pipe

RECOMMENDED SIMPLIFIED PRACTICE FOR WIRE FABRIC FOR CONCRETE PIPE MANUFACTURE[1]

Area	Pipe Size (Inches) and Specifications[2]	Spacing of Wire in Inches	Gauge of Wire	Weight per 100 Sq. Ft.
.069	10, 8 culvert pipe	3x6	9/9	37
.074	C75-12 L H, 15 L H, 18 L H	4x6	7/8	41
	21 L H, 24 H, 27 L-36 H, C76-12 H	4x12	7/8	34
.098	C75-30 H, C76-15 H	3x8	7/8	46
		3x12		42
.116	C75-24 L, 27 L, 30 L and H, 33 H, 36 L, 42 L H, 48 H,	3x8	6/9	50
	C76-12 L, 15 L and H, 18 H	3x12	6/9	47
.120	C75-30 L, C76-18 H	4x8	4/8	54
		4x12		51
.124	C76-18 H	2x8	8/8	54
		2x12		51
.140	C75-33 L, 48 L, 54 H, C76-18 L	4x8	3/8	62
		4x12	3/8	58
.148	C75-60 H	2x8	7/8	63
		2x12		59
.174	C76-24 H, 30 elliptical	2x8	6/8	72
		2x12		68
.187	C75-54 L, 60 H, 66 H, 72 H, C76-24 H, 36 H	3x8	3/8	77
		3x12		74
.217	C75-60 L, 78 H, 84 H, C76-24 L, 30 H, 36 L, 42 H	3x8	2/7	90
		3x12		86
.221	C76-30 H and 36 L	4x8	0/5	98
		4x12		92
.252	C75-66 L, 72 L, 90 H, C76-42 L, 48 H (30 in. pipe, 3½ in. wall), 24 X	3x8	1/6	105
		3x12		100
.281	C76-24 X and 36 X	2x8	3/8	109
		2x12		105
.303	C76-54 H	2x8	2½/7	119
		2x12		115
.325	C75-96 H, C76-48 L, 54 H, 60 H, 30X, 36 X, 42 X	2x8	2/7	127
		2x12		123
.351	C76-60 H and 42 X	2x8	1½/6	138
		2x12		133
.337	C76-108 H, C76-54 L, 66 H, 48 X	2x8	1/6	148
		2x12		143
.410	C76-60 L, 72 H	2x8	0&1/6	159
		2x12		154
.480	C76-66 L, 72 L, 78 H, 84 H, 54 X	2x8	0&00/5	186
		2x12		180
.516	C76-78 L, 84 H, 60 X	2x8	00/4	202
		2x12		195
.560	C75-90, C76-66 X	2x8	00/000/3	224
		2x12		216
.619	C76-84 L, 90 H, 96 H, 66 X, 72 X	2x8	000/3	242
		2x12		234

[1] Abbreviated List.
[2] L—light; H—extra heavy.

for cast iron and steel pipe in drainage and air duct projects; the use of concrete pipe in frozen ground, covering compression and heaving; and the use of vibrators to clear lines feeding concrete to pipe machines. The effect of winery slop on concrete pipe was discussed. In conclu-

E. H. Curtis

sion, the use of fly ash in making concrete pipe was covered by Harry Cain, Continental Concrete Pipe Corp., Chicago, Ill.

The first paper of the convention was presented by Hal H. Hale, Executive Secretary of the American Association of State Highway Officials. His talk was titled *Highways in the Economic Structure of the Country.* Mr. Hale pointed out that the postwar highway program has been slowed down by high prices, but that over $750,000,000 in projects are now under contract. It is to be hoped, he said, that the new Congress will pass a bill extending the grace period under the Federal Aid Highway Act of 1944, so that the states may get their remaining funds under contract. Such a bill is now in Congress. Mr. Hale indicated by statistics that the highway program is self-supporting, showing that $1,025,000,000 was collected in gasoline taxes in 1946, together with $530,000,000 in other highway user taxes (grease, oil, sales tax, etc.), a total of $1,555,000,000. Of this amount $465,000,000 was available to state highway departments in 1946, and with $147,000,000 in federal aid, $612,000,000 was available. The sum of $485,000,000 was actually spent, leaving a surplus of $127,000,000 for 1947. In his closing remarks Mr. Hale made the statement that the compensation paid to highway department personnel is a national disgrace, and illustrated this claim with examples showing the disparity in pay be-

John A. Patton

tween privately and publicly employed engineers.

D. C. Greer, state highway engineer of Texas, spoke on the *Federal Farm-to-Market Road Program.* He briefly explained the federal aid program, and went on to point out that other things, such as the fertility of the soil, must be considered when a farm-to-market road is to be paved, for the traffic may double after completion of the work. Traffic on the main road system may be increased by as much as six times when an adequate farm-to-market system is in operation.

In Texas the aim of the state highway department is to provide dustless all-weather roads which will be passable 360 days a year. It is felt that the expense of more costly bridges to provide 365 day passable roads is not justified. All farm-to-market roads now being constructed are two-lane, built to last 15 years, with all structures able to support two 15-ton trucks. It has been shown in Texas that farm-to-market road construction is justified, as the annual loss in value of the tomato crop alone is over $100,000 due to bruising of the fruit in transport over rough gravel roads. Similar damage occurs in the case of the watermelon crop.

Farm-to-market roads now cost $9,300 a mile in Texas, with a $60,000,000 program in prospect. Roads are revenue producing, Mr. Greer said, and our road systems should be expanded.

R. Robinson Rowe, senior bridge engineer, State of California, Department of Public Works, an expert on the design and installation of culverts, spoke on *Concrete Pipe Culvert Practice in California.* Until 1940, he said, fills over concrete pipe were limited in height to 20 feet. Investigation of this practice proved that higher fills could be used, and further investigation showed that when the imperfect trench method was used, overfills of 75 to 100 feet could be made. The preferred method of laying in California involves the use of a firm cushion under the pipe, and a flexible cushion over the pipe. A 30-inch pipe, with a 65-foot overfill of this type has been in service for the past six years without a failure, so the method may be assumed to be successful. Mr. Rowe went on to emphasize the need for a new and speedier laying and joining technique that will permit concrete pipe to be laid under a highway in use. If a system could be evolved that would permit normal traffic flow on the fourth day, the market for concrete pipe would be increased. In conclusion, Mr. Rowe explained how concrete pipe is used to control creeks that run in the same canyon with roads. Originally, he said, the roads were made narrow enough so that both creek and road had plenty of room. As traffic became heavier, and the roads were widened, it became necessary to "move the creeks over." Now, with four-lane highways under construction, the highway department would like to "move the creeks out altogether." Since this is impossible, concrete pipe is being used to contain the water where it might interfere with the road. In some cases the creeks pass under the road, and in other cases the water makes an S or U turn under the highway. In one case the stream goes underground in concrete pipe, and travels for 600 yards under the shoulder of a new roadway.

After a talk by Paul Jones, director or public information, National Safety Council, H. G. Curtis, section head, Canals Division, Bureau of Reclamation, Denver, Colo., read two papers prepared by colleagues in the bureau who were unable to appear at the convention.

The first of these talks was authored by Kenneth Markwell, assistant commissioner, U. S. Bureau of Reclamation. He said that over 1,000 miles of concrete pipe had been used so far in the irrigation distribution systems of the Bureau of Reclamation. The current construction program calls for the use of hundreds of additional miles of concrete pipe.

Precast concrete pipe, he said, plays an important role in supplying water to the 4,000,000 acres of irrigated land which in 1946 produced 12,000,000 tons of food and forage crops. It is to be expected that the use of concrete pipe would increase

with the arrival of lighter weight units and improved joining methods.

Summing up, Mr. Markwell said that it should be remembered that reclamation work does not benefit alone the area where the actual construction takes place, but benefits the entire nation, producing wealth and taxes on a scale that increases with the passage of years.

The second paper read by Mr. Curtis was written by H. R. McBirney, chief of the Canal Engineering Division, and was on the subject of *Concrete Pipe—Its Use on Irrigation Works of Bureau of Reclamation Projects.* In this paper Mr. McBirney first reviewed the history of reinforced concrete pipe in the United States and in Europe. In Europe, he said, the primary difficulty with concrete pipe has been leakage through the body of the pipe, while here the main trouble has been leakage at the joints. The Lock Joint Pipe Co. has permitted the bureau to use its patented joint, thus aiding in the solution of the problem in the irrigation field.

Discussing some of the best known aqueducts composed partially of closed concrete conduit, Mr. McBirney revealed that a portion of the Salt Lake City aqueduct—14 miles of 69-in. pipe—is soon to be advertised for bids. The paper closed with a forecast of an expanded construction program.

On Wednesday John A. Patton, management engineer, Chicago, Ill., spoke on the *Wage Incentive as Applied to the Concrete Pipe Industry.* It was pointed out by the speaker that the standard of living in the United States has gone up two and one-half times since 1909. The incentive system is largely responsible for this, Mr. Patton said. This system provides the only means to pay the worker in proportion to his production, and by doing this, leads to lower unit cost per item for the company and greater take-home pay for labor. It is vitally important, however, that the inventive system be properly installed. Mr. Patton outlined one method of setting up a successful wage incentive plan. Briefly, this is as follows:

1. The plan must be simple and easily understood.
2. It should have the continuous attention of top management.
3. It should provide a guaranteed wage.
4. Production and workers' pay should both go up.
5. Standards should be set fairly and properly.
6. There should be a very limited use of temporary standards.
7. The old basic rate (before the plan) should become the new guaranteed wage.
8. The piece cost should go down.
9. A detailed time study plan should be used to determine the base rate of pay.
10. An incentive plan aimed at small groups of workers is better than a plan aimed at large groups.
11. The foreman must be trained to listen sympathetically to workers' complaints of low rates.
12. If 80 to 90 percent of the employees in a plant cannot be paid on an incentive basis, the plan should not be adopted.
13. There should be no limit on a worker's income when he increases his output, and in any case, earnings must go up at least 1 percent initially, or the plan will not work.
14. Indirect employees should be tied into the plan.

Mr. Patton then outlined and discussed the three general classes of wage incentive plans. Number one, the measured-day work plan, has been used in the automobile industry. The second, the standard time, or standard premium plan, is the best of the three, while the third plan is the piecework system, which is in common use, but is not favored by Mr. Patton. Much interest was evidenced by the audience, and a spirited discussion took place.

At noon a luncheon was given by the LaClede Steel Company, makers of wire mesh reinforcing. Following this, as a very fitting wind-up to the 1947 meeting of the A.C.P.A., Laclede Steel played host to the convention delegates at their plant at Alton, Ill.

Progressive Block Plant

(*Continued from page* 113)

Monroe belt-type conveyor driven by the block machine. This conveyor elevates concrete to the storage hopper of the block machine, giving a continuous feed.

The block machine itself is a Monroe automatic hydraulic tamping model, with a 5-hp. motor which operates both the hydraulic pump and the shaft on which the tamper lift arms are mounted. All machinery in this plant was supplied as a "package" by the Dutton Machinery and Equipment Co., Chicago.

• A full rack of blocks comes from one of the 6x7½x28-ft. drying rooms behind the block machine. Second floor storage space, on level with railroad siding, holds bag cement, pallets and equipment.

As has been stated, nearly 1400 blocks a day can be produced at Westmont. That this figure can be easily maintained is due in part to the ingenuity of Mr. Krodell, whose homemade offbearer greatly lightens this tedious work.

This offbearer, like the plant, is constantly being improved. In its present form tongs are suspended on ¼-in. wire rope, which passes over two pulleys mounted on a simple turning boom, fabricated by welding strap steel, steel pipe, and old automobile brake drums. A gallon can, loaded with sand, acts as a counterweight and slides into a cage made from four pieces of angle iron welded in box shape and secured by strap steel. The next improvement, according to Mr. Krodell, will be to make the lower limit of travel of this counterweight adjustable by the use of a removable rod passing through holes drilled in the iron frame. This, in turn, will permit the tongs to rest at varying heights above the floor.

Standard block, 8- by 8- by 16-in., are being produced at present, although equipment to produce 4- by 8- by 16-in. partition block is on order. Septic tank rings, and concrete joists, will be produced later on.

The blocks are lifted directly from the machine to Dutton four-tiered steel racks, which are moved, when full, into the drying rooms on a "Well-Built" jack-lift truck. The drying rooms, in reality incomplete kilns, are unheated, but steam equipment and other necessary items are on order and will be delivered in a short time.

Two 6- by 7½- by 28-ft. kilns are located immediately to the rear of the block machine, and one 6- by 7½- by 50-ft. kiln runs out into the storage yard from the west end of the plant building. A second such kiln will be erected alongside the existing one at a later date.

When dry, the blocks are stacked outside the building (as illustrated), until they are shipped. Some blocks are delivered in a Dodge dump truck owned by the company, and in other cases, contractors send their own trucks.

Conrad Krodell is president of Westmont Cement Products; Joseph Spurney is vice-president; Emil Geisler is treasurer; and Vern Frederick is secretary.

New Roofing Machine Makes 150 Concrete Tile per Hour

•A California-type home with roof of interlocking tile.

ONE of the men who are contributing to the expansion of the concrete industry by developing new products is C. E. Barber of the E. P. Barber Co., manufacturers of the new Bartile roofing machine at 560 West Valley Blvd., Bloomington, Calif. His latest invention is a machine that turns out from 120 to 150 perfect concrete roofing tile per hour.

The Bartile roofing machine consists basically of a specially-designed metal stand on which is mounted a mold, and a hand-operated tile-shaper or trowel. Into the mold fits a thin metal pallet that shapes one side of the tile and supports the tile until it is sufficiently cured to retain its shape for balance of curing.

Mounted on the stand is a ¼-hp. electric motor with an eccentric device that vibrates the pallet so that the plastic cement mix is settled solidly in the mold. Attached to the stand is a foot-operated device that ejects the finished tile (supported by the pallet.)

The trowel is so designed that it moves easily across the top of the mold, shaping and glazing the face, or upper side of the tile. The finished tile sets sufficiently in 12 hours to be removed from the pallet. Tiles are then stacked in a sheltered place out of the sun and watered several times (depending upon the season) daily for ten days. At this time tiles are sufficiently cured to be ready for installation.

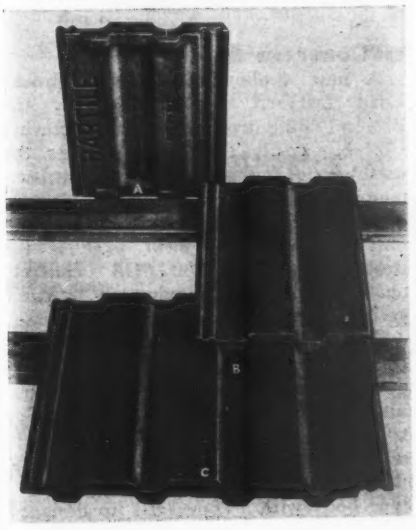
The trim (rakes, ridges, and hips) is made in a similar fashion, but no ejector or vibrator devices are necessary.

It is estimated that an unskilled laborer with a little practice can make approximately four squares of roofing (600 tile) per day.

The finished tile is said to be strong, waterproof, fireproof, good-looking and will last the life of the building it covers. It is lightweight, can be made in any color desired and actually improves with age.

The standard tile is self-locking and is easily installed. It requires no nails, but is simply laid on the roof, the lugs of each tile holding it firmly in place by extending over the one-by-fours of the roof frame.

No waterproof paper or solid sheeting under the tile is necessary because the tiles doubly interlock with one another to become completely weather and waterproof. Bartile, being made of concrete, is also fireproof and combines perfectly with concrete blocks to make a completely fireproof building.



•Left: A close-up showing interlocking features of the tile. Below: The ¼-hp. machine which makes the tile.

CONCRETE BLOCK *Manufacturers*

IMMEDIATE DELIVERY ON JAY-BEE MIXERS!

MOTOR INCLUDED!

Rugged construction! Twin spiral mixing blades! High quality steel cut gears! Regulated discharge! Visible mixing! Job-tested design! 12 to 24 cu. ft. sizes. Other sizes to your specifications. ORDER NOW!

J. B. HUNT & SONS
INCORPORATED
323 West Martin St., Raleigh, N. C.

FREE LITERATURE

Write for Details and Price List Today!

For Improvement in

Quality - Sales • Profits

Install [SC]Z PRECISION CONCRETE CONTROL It Includes

Moisture Meter

Makes a test for moisture content of fine or coarse aggregates in ONE minute. Accurate to ¼%.

Compensator

Delivers correct DRY weight of wet aggregates and ADDED water. Makes a graph record of EVERY BATCH.

[SC]Z CONTROL produces *uniform* concrete. Is always approved by concrete engineers. Has definite sales value. Write for our booklet "Profits in Concrete."

SCIENTIFIC CONCRETE SERVICE CORP.
724 Salem Avenue, Elizabeth 3, N. J.

BUY KENT and Get

Air Controls are also adaptable to older KENT Tampers and Strippers

PROVEN PERFORMANCE

plus Advanced Refinement

Consider for example this Kent Tamper and Stripper. Both have been widely popular for many years. And now, in refined form they are available with air controls.

Simply operate the valves and both machines respond instantly — positively — efficiently. Since the labor element is minimized the normal large output of these time proven machines is "stepped up".

Yes, you can buy Kent equipment with assurance of satisfaction.

Consider, too, that you can start with one or more Kent machines and later add related and coordinated KENT units as developments justify. Or if you are starting in business, you can do no better than to purchase a complete KENT plant with continuous or batch mixer and all units developed to operate speedily, efficiently, profitably with other units.

Get the Kent story. Check the coupon below, write your name and address in the margin, tear off and mail.

The KENT MACHINE COMPANY

Manufacturers of CONCRETE PRODUCTS MACHINERY Since 1925

CUYAHOGA FALLS, OHIO, U.S.A.

☐ KENT Vibra-Tamp
☐ KENT Batch Mixers
☐ KENT Continuous Mixers
☐ KENT Aggregate Elevators P. Q.
☐ KENT Elevators
☐ KENT Lift Trucks
☐ KENT Strippers
☐ KENT Steel Racks
☐ KENT Feeders
☐ KENT Pallets
☐ KENT Tampers
☐ KENT Dunkers

NEW MACHINERY and SUPPLIES

● Lightweight Dockboard

A labor-saving device perfected by the Magnesium Company of America, One N. LaSalle Street, Chicago, is its "Magcoa" lightweight magnesium dockboard, manufactured in approximately 530

Magnesium loading bridge.

standard sizes and capacities. It was designed to replace heavy steel plates used as bridges between loading docks and freight cars or trucks. One of these dockboards weighs about one-fourth as much as steel boards of equal strength and capacity.

A slight bend in the surface of the board compensates for the difference in heights bridged by it, tending to expedite handling operations. Since magnesium, the material employed, is nonsparking, the safety factor of the device is considerably strengthened. The structural members which reinforce the board also prevent slipping.

Magnesium Co. of America offers customers a service by which the dockboard is tailored to meet the precise conditions of the operation for which it is intended.

● Concrete Bucket

A new application for the "Brooks Load Lugger," manufactured by the Brooks Equipment and Manufacturing Co., Knoxville, Tenn., will further the usefulness of this unit. Provision has been made for transporting concrete from mixing plant to the construction site. The unit shown on the next page is the Brooks Model CH-200 "CB" concrete bucket, capacity approximately 2 cubic yards of wet concrete.

This bucket would be particularly applicable for moving air-entrained concrete over considerable distances. It eliminates moving the mixer to the job or transporting the concrete in a concrete mixer truck.

The photograph shows a special tilt-type body with a converged lip designed

CINDER CRUSHERS
FOR BLOCK MAKERS

7 DAY DELIVERY

10 to 20 ton per hour capacity **$345** 25 to 50 ton per hour capacity **$795**

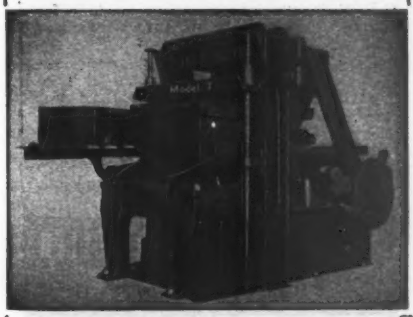
CONVEYORS

A wide range of models for many industries; including block, stone and mining. Both stationary and portable types, for stacking, truck and car loading.

BONDED SCALE CO.
129 Bellview Ave.
Columbus 7, Ohio

Manufacturers of Scales, Crushers, Conveyors and Vibrating Screens

The Vibration Machine Supreme



Vibration under pressure — 7,200 blows per minute—and ruggedly built to give long life, the Joltcrete machine is the choice of the wise concrete-products operator. Produces clean-cut, high strength units in any size, and gets the most out of a bag of cement. Built in three sizes with capacities of 7 to 9 standard units per minute.

Stearns Clipper Stripper Machines; Stearns Joltcrete Machines; Stearns Mixers; Cast iron and Press Steel pallets. Straublox oscillating Attachments, etc. Repair parts for: Anchor, Stearns, Blystone Mixers and many others.

ANCHOR CONCRETE MACHINERY CO.
G. M. Friel, Manager — Columbus, Ohio

Dumps on the job.

for discharging material in constricted areas. For example, the concrete can be poured at any rate desired through the door by raising and lowering the handle. The truck can be moved over a trench and the concrete allowed to flow through this door to the required depth.

● Concrete Vibrators

Electric vibrators for compacting concrete are being manufactured by the Viber Co., 726 S. Flower St., Burbank, Calif.

Universal type electric motors (10 to 220 volts, a.c. or d.c.) cooled by forced ventilation, are used for power. The torque is transmitted by means of a rubber-covered flexible steel braid casing, and a flexible steel core.

Get the most from air entrainment . . .

use ***DAREX AEA**

Maximum benefits are a direct function of controlled air. Maximum benefits are possible only when the air entraining agent is proportioned at the mixer.

For average concrete the use of one ounce of DAREX AEA per sack of cement will entrain approximately 3% to 5% of air. For other types of mixes and unusual sand gradation, the quantity of DAREX AEA can be adjusted to obtain the desired air content.

In the manufacture of concrete blocks where larger quantities of AEA are necessary, the quantity of DAREX AEA added can be adjusted to obtain maximum benefits.

HERE'S WHAT YOU GET WITH DAREX AEA:

IN READY MIX CONCRETE
- Improved plasticity
- Easier placement
- Reduced segregation
- Less green shrinkage and bleeding
- Quicker finishing
- Permits reduction in fine aggregate

IN CONCRETE BLOCK
- Increased production by practically eliminating green breakage and culls
- Improved surface texture
- Increased strength
- Reduced moisture absorption

DAREX AEA, the approved air entraining agent, comes ready to use and it is not harmful to handle.

DEWEY AND ALMY CHEMICAL COMPANY
Chicago, Ill. — Cambridge, Mass. — Oakland, Cal.

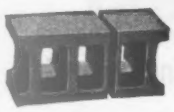
*T. M. Reg. U.S. Pat. Off.

FASTER CUTTING ...with Clipper Masonry Saws

Your Special Size and Shape Brick or Concrete Block can now be "Tailor-Made" at a moment's notice!

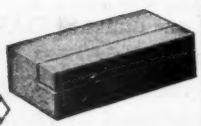
The new Clipper Multiple Cutting Principle makes possible faster cutting of every masonry material regardless of hardness.

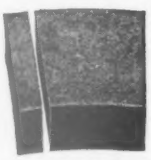
Here are a few typical examples of the speed and accuracy with which concrete products and fire brick can be cut.



This concrete block, converted into a special size, was cut completely in two in 19 seconds.

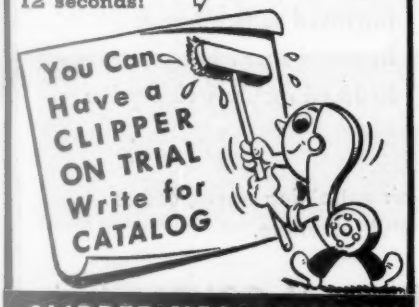
One of the many intricate cuts performed on first quality clay brick for heat treating furnaces —made in 8 sec.





Rotary Kiln Blocks, cut to size for "key" bricks in rotary kilns, require only 10 sec. for completion of cut.

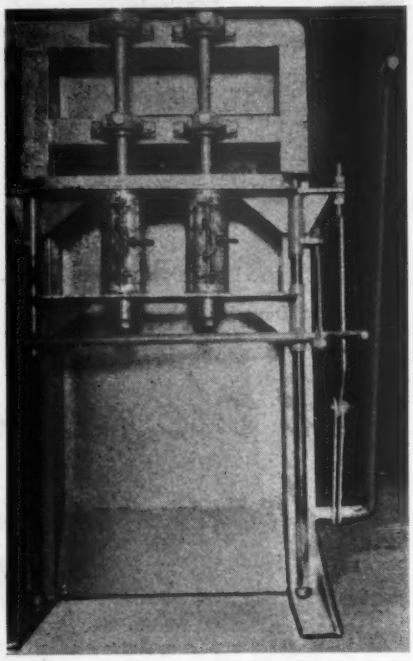
Basic refractories for steel furnaces or cement kilns must be accurately installed. This magnesite brick was cut in 12 seconds!



CLIPPER MFG. COMPANY
2801 Warwick, Kansas City 8, Mo.

● Drain Tile Machine

The C. M. Wooten Co., 2717 N. Central Ave., Knoxville 17, Tenn., has added the Model D-4, farm drain tile machine to its line. It is claimed that



Makes farm drain tile.

the machine will turn out drain tiles at the rate of four per minute.

The machine comes equipped with 5-hp. electric three-phase motor, mounted overhead so as to prevent the concrete from damaging the motor and other working parts. The maker states that 14 bags of cement and two cubic yards of sand will make 1,000 tile, 4-inch size. The D-4 comes in three sizes, all of the heavy-duty type.

● Batch Mixer

Concrete products producers may now obtain the new "Red Line" batch mixer from the Kent Machine Company, of Cuyahoga Falls, Ohio. Rugged and lasting quality is made possible by the use of over-sized shafts; heavy, all-welded drums; and heavy ball and roller bearings and supports. All mixers have cut gearing with steel pinions, and are equipped with the "Falls" friction clutch. The mixer blade design is said to provide proper shovel angle for turning over the aggregate and to maintain equalized distribution and blending as the material moves across the trough. Mixers are available with capacities ranging from 12 cubic feet to 50 cubic feet, and paddle shaft rotations varying from 27 to 20 rpm. All sizes can be furnished with v-belt drive from the motor to driving pulley.

What do you want to know about the ready-mixed concrete industry or about concrete blocks, pipes, etc.? The Concrete Industries Yearbook can probably tell you.

IMMEDIATE DELIVERY

A Western
AIR-AUTOMATIC
Equipped
CONCRETE BLOCK PLANT

Compresses and Vibrates Simultaneously

The answer to the Block manufacturer's prayer for SIMPLICITY Combined with DURABILITY.

The 2200 vibrations per minute plus the precision compression guarantee a faster made, more uniform BLOCK.

Because of this same principal of operation the "WESTERN" machine is small and compact and has a MINIMUM number of wearing parts.

Here's What "Western" Owners Have to Say!

J. A. B.: "after using your machine for 5 mos. the only repair I find necessary is the replacement of a V-Belt."

K. C. Block Company, "one of our city's largest contractors, told us that we were making the truest block he was able to obtain."

R. L. Block Company: "The other day one of our operators made 865 blocks in ONE HOUR on your single machine. He has made consistently 320 *per hour.*

AUTOMATICALLY CONTROLLED
NO LEVERS

Proven Capacity:
1500 to 4000 BLOCKS PER DAY

Complete Plant equipment for the Block manufacturer (mixers, conveyors, hoppers, sturdy steel drying racks with 56 block capacity, lift trucks and drying room heating equipment).

Call or write Dept. P

B & W BRICK & MATERIALS CO.
228 N. LASALLE STREET
CHICAGO 1, ILLINOIS